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SAFER FOODS FOR AMERICA: AT WHAT COST?

Y 4.G 74/7: F 73/23

Safer Foods for America: At What Cost?, July 27, 1993 (103-1 Hearing)

HEARING

BEFORE THE

HUMAN RESOURCES AND INTERGOVERNMENTAL RELATIONS SUBCOMMITTEE

OF THE

COMMITTEE ON GOVERNMENT OPERATIONS HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

JULY 27, 1993

Printed for the use of the Committee on Government Operations

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SAFER FOODS FOR AMERICA: AT WHAT COST?

TUESDAY, JULY 27, 1993

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HUMAN RESOURCES
AND INTERGOVERNMENTAL RELATIONS,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2247, Rayburn House Office Building, Hon. Edolphus Towns (chairman of the subcommittee) presiding.

Present: Representatives Towns, Schiff, Horn, Mica, and Sanders.

Staff present: Ronald A. Stroman, staff director; William Layden, Allegra Pacheco, and Brenda E. Pillors, professional staff members; Martine M. DiCroce, clerk; and Martha Morgan, minority professional staff member.

Mr. TOWNS. The Subcommittee on Human Resources and Intergovernmental Relations of the House Committee on Government Operations will come to order.

This begins a series of hearings by this subcommittee on food safety. Americans have every reason to be concerned about the safety of our food supply. Last month the National Academy of Sciences reported that pesticide residue was widespread in the U.S. diet and were consumed regularly by most Americans, including infants and children.

In another report, the Environmental Working Group concluded that millions of children in the United States received up to 35 percent of their entire lifetime doses of some carcinogenic pesticides by the age of 5.

That report also warned that America's food supply is not Americas wholly safe from harmful chemicals. Nevertheless, over 800 million pounds of active pesticide ingredients continue to be used in American agriculture each year.

It is not only the American consumer that is concerned about the harmful effects of pesticide applications. Farmers themselves want to reduce their use of agrichemicals. In 1992, a public voice study of Wisconsin farmers found that approximately 75 percent of farmers who use chemicals reported that they would prefer to reduce their reliance on such chemicals. The benefits to farmers in reducing pesticide use were many. They are expensive, they contaminate the drinking water, they pose health hazards to farm families and workers, and they harm the farmers' land.

With the American public ever more concerned about food safety and the increasing success of alternative agriculture methods, now is the time to seriously consider reducing pesticide use and making our food safer.

Already the Clinton administration has committed to intensify the Federal Government efforts to promote integrated pest management and other sustainable agriculture practices. I believe that the administration is on the right track with this commitment to reducing pesticide use.

However, as we continue to improve the safety of America's foods supply, we must make sure that pesticide-free foods and food products with lower pesticide residuals will be distributed at affordable prices to all sectors of our society—from rural areas to the inner cities of the United States of America. The issue of food safety transcends economic class, ethnicity, and gender and is a national public health concern. No one is immune from the dangers of harmful chemicals—safer foods must be available to all Americans.

At this time, I would like to yield to Mr. Horn for an opening statement and any comments that he might have at this time.

[The prepared statement of Hon. Edolphus Towns follows:]

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OPENING STATEMENT OF THE HONORABLE EDOLPHUS TOWNS, CHAIRMAN

Subcommittee on Human Resources and Intergovernmental Relations

Will the Subcommittee on Human Resources and Intergovernmental Relations of the House Committee on Government Operations please come to order.

This begins a series of hearings by this subcommittee on food safety.

Americans have every reason to be concerned about the safety of our food supply. Last month, the National Academy of Sciences reported that pesticide residues were widespread in the U.S. diet and were consumed regularly by most Americans, including infants and children. In another report, the Environmental Working Group concluded that millions of children in the United States receive up to 35 percent of their entire lifetime doses of some carcinogenic pesticides by age five. That report also warned that America's food supply is not wholly safe from harmful chemicals.

Nevertheless, over 800 hundred million pounds of active pesticide ingredients continue to be used in American agriculture each year.

Alternative agriculture is designed to minimize the environmental and public health dangers from pesticides while maintaining a high level of productivity. And it works. Indeed, the National Academy of Sciences concluded in 1989 that based on its own case studies, "the most profitable alternative and conventional farms . . . [were] those that successfully cut back on fertilizer, pesticide, and machinery expense while sustaining high levels of crop production."

With the American public ever more concerned about food safety and the increasing success of alternative agriculture methods, now is the time to seriously consider reducing pesticide use and making our foods safer. Already the Clinton administration has committed to intensifying the Federal government's efforts to promote integrated pest management and other sustainable agricultural practices. And I believe that the Administration is on the right track with its commitment to reducing pesticide use.

However, as we continue to improve the safety of America's food supply, we must make sure that pesticide-free foods and food

products with lower pesticide residues will be distributed at affordable prices to all sectors of our society -- from rural areas to the inner cities. The issue of food safety transcends economic class, ethnicity and gender and is a national public health concern. No one is immune from the dangers of harmful chemicals . . . safer foods must be available to all Americans.

This hearing will explore the viability of producing foods nationwide using alternative methods to chemical agriculture and will examine whether Americans must pay more to have safer foods. As you can see from the witness list, we have an ambitious agenda and I ask for everyone's cooperation in adhering to the five minute rule. I look forward to hearing from all of our distinguished witnesses.

Mr. HORN. Thank you, Mr. Chairman.

I commend you for holding this hearing. This is a vitally important subject. I happened to grow up on a farm and we did not use pesticides. I am not sure they were invented when I grew up on a farm, but the fruit was still delicious and it grew.

It is often said that Members of Congress have only one thing in common; we are all elected. We have another thing in common; we all eat. So we are as concerned as you are.

One question I would like to hear some response on from all panels is the degree to which our ability to detect toxins has gone beyond perhaps what we need in some areas to be safe. I am thinking of the analogy to the Clean Water Act. I happen to sit on the Public Works and Transportation Committee and the Water Subcommittee that has jurisdiction.

One of our problems and one of our opportunities is we can detect so fine a residue of possible toxins that almost no water in the United States would be able to pass that standard. I wonder to what degree that becomes a problem when we deal with various types of pesticides. I look forward to the testimony of the witnesses.

Mr. TOWNS. Thank you, Mr. Horn.

Mr. Sanders.

Mr. SANDERS. Thank you, Mr. Chairman. I will be very brief.

I want to thank you for holding these hearings on pesticides and sustainable agriculture because many of us, and in my State of Vermont I think people are particularly conscious of this, feel that there must be a change of policy regarding the levels of chemicals that we allow our population to come into contact with.

The National Academy of Science Report on Pesticides and Children, which prompted these hearings, finally recognizes something that this country should have admitted a long time ago; that health and the well-being of our people should take precedence over economic gain in any industry.

One of the things that we have seen is the chemical industry operating in a very unregulated manner and many of our people, especially those of us who are parents, are not fully aware of what our children are ingesting. What frightens me most about our general health policies in this country is that we consistently fail to focus on prevention.

One of the areas that my office has spent time on is the whole issue of the causation of cancer. We spend an enormous amount of money in this country, we spend billions of dollars a year treating cancer, trying to detect cancer, and what must be said is that after all of those years, all of that effort and all of that money, we know very little about the causes of cancer.

There are more and more serious researchers, and the work is very controversial, but there are more and more serious researchers who look at the escalating cause of certain cancers and see it related to the environment and look at pesticides as one of those causes. Admittedly, people have different points of view, but if we are going to look at the horror of cancer in this country, I think this is one of the areas that we must touch upon.

I thank you for holding this hearing. It is getting into very important work.

Mr. TOWNS. We have also been joined by a person who has been in the forefront in terms of dealing with environmental issues and health, Congressman Synar.

Mr. SYNAR. Chairman Towns, let me commend you for your first hearing on food safety and your leadership in this subcommittee. I am glad to join you; as chairman of the Environment, Energy and Natural Resources Subcommittee, we have been interested in these issues over a number of years, and your membership on that subcommittee has enhanced us and you use those talents as you chair this subcommittee.

Every few years, sometimes every few months, we hear another call for food safety reform. We see Federal agencies ignore deadlines. They ignore the law. They ignore the directives of courts. They ignore the demands to consumers. Our current system is a failure.

Senator Leahy and I released a GAO report last month which revealed that EPA, which regulates pesticide products, will miss its deadlines to complete its review of older pesticides. The report's title I think tells it all "Pesticide Registration May Not Be Completed Until The Year 2000."

After 20 years of so-called implementation, EPA has completed the reregistration of only 31 of almost 20,000 pesticide products. At this rate, 31 out of 20,000 products since 1972, reregistration could take EPA until the year 15,520 A.D. to complete.

Last month, we also released the published record of the hearing my subcommittee held last summer. The record from that hearing revealed that even with the flawed food consumption data currently in use, 34 pesticides have possible residues which exceed the safety standards—the allowable daily intake—by more than 1,000 percent for infants age 1 to 6. The hearing record also revealed that 67 pesticides in our food cause cancer and 98 pesticides contaminate our groundwater.

GAO and EPA's inspector general have produced literally a stack of negative reports almost 2 feet high over the years. What we need now is not more negative reports designed to alarm consumers or glossy press releases hoping to soothe public concerns. We need to take serious action and responsibility to fix this program, to make the hard choices, and not to continue to put off the difficult decisions we have ahead of us.

We know what the problems are. We have just been conveniently neglecting the solution.

I thank the chairman for the opportunity to be here today.

Mr. TOWNS. Thank you.

[The prepared statement of Hon. Mike Synar follows:]

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STATEMENT OF HON. MIKE SYNAR (D-OK)
Chairman
Subcommittee on Environment, Energy, and Natural Resources

July 27, 1993

Today marks the first hearing about food safety held by this Subcommittee under the leadership of its new Chairman, Mr. Towns. I'm sure the Subcommittee members will be shocked to learn what all newcomers to this issue learn: that the system in place to regulate pesticide residues in food is in disrepair and badly needs to be overhauled from top to bottom.

Every few years we find another critical review of how pesticides are regulated. Every few years, sometimes every few months, we hear another call for food safety reform. We see federal agencies ignore deadlines of the law, directives by the courts, and demands by consumers. Last month the National Academy of Sciences discovered that our pesticide residue standards aren't protective of children and infants -- but guess what, the standards aren't protective of anyone, except maybe the pesticide companies.

I hope this year, this Congress, and this Administration will get to the important tasks at hand. We know our current system is a failure. Just last month, Chairman Leahy of the Senate Agriculture Committee and I released a GAO report which revealed that EPA, which regulates these products, will miss its deadlines to complete its review of older pesticides. We thought we overhauled the system with amendments in 1988 to the pesticide law (FIFRA). The 1988 amendments in turn were an attempt to complete the tasks set out in amendments enacted in 1972.

But the GAO report's title says it all: "Pesticide Reregistration May Not Be Completed Until 2006." After twenty years of so-called implementation, EPA has completed the reregistration of only 31 out of almost 20,000 pesticide products. **At this rate -- 31 of 20,000 products since 1972 -- reregistration would take EPA until the year 15,520 A.D. to complete.** Obviously, progress in this program is better measured in units of geologic time.

Also last month, we released the published record from a hearing held last summer by my own Subcommittee on Environment, Energy, and Natural Resources. The record from that hearing revealed that even with the flawed food consumption data currently in

use, 34 pesticides had possible residues which exceeded the safety standard --the allowable daily intake -- by more than 1000% for infants aged 1 through 6.

That hearing record also revealed that 67 pesticides in our food cause cancer, and that 98 pesticides contaminate our groundwater.

Each Congress, the Environment Subcommittee has held three or four hearings on the regulation of pesticides. We have requested numerous GAO investigations about the failures to protect the public from the risks of pesticide residues in food and the risks to the farmers and ranchers who use these products.

Over the years the GAO and EPA Inspector General have produced a stack of negative reports almost two feet high. Hearings before the Environment Subcommittee and those reports by GAO and the Inspector General over the past years reveal a consistent failure to implement both the spirit and letter of the law.

What we need now is not more negative reports designed to alarm consumers or glossy press releases hoping to sooth public concerns. We need to take seriously our responsibility to fix these programs, make the hard choices, and not continue to put off the difficult decisions ahead of us.

We know what the problems are, we have just been conveniently neglecting the solutions, since it will necessarily mean a change in the way pesticides are regulated. But waiting won't make these issues easier to deal with.

Mr. Chairman, I appreciate the opportunity to participate in today's hearing.

Mr. TOWNS. At this time, we call the witnesses: Dr. Allen Rosenfeld, an agronomist and director of public relations at Public Voice; Dr. John Aguirre, director of Federal Government relations at the National Food Processors Association; and Mr. Sherwin Gardner, senior vice president of science and technology at the Grocery Manufacturers of America.

Before we begin, I would like to first thank the witnesses for taking the time out of your busy schedules to come and to share with us. We ask each of you to testify and then we will have questions. We ask that you submit your entire statement for the record and of course if you would summarize within 5 minutes which will allow us to have an opportunity to raise questions with you, we would appreciate it.

Why don't we start with you, Dr. Rosenfeld.

STATEMENT OF ALLEN ROSENFELD, DIRECTOR OF GOVERNMENT RELATIONS, PUBLIC VOICE FOR FOOD AND HEALTH POLICY

Mr. ROSENFELD. Thank you, Mr. Chairman.

My name is Allen Rosenfeld, and I am acting codirector of Public Voice for Food and Health Policy, a national nonprofit consumer organization. I am pleased to be here to present Public Voice views on the need and opportunities for alternatives to chemical-based farming methods.

The timing of this hearing could not be more opportune. With the recent release of the NAS report on pesticides in children and the administration's new commitment to reducing farm chemical use, Federal food policy is at a historic crossroads.

The NAS report's findings that Federal pesticide tolerances do not protect our children adequately is the latest piece of evidence indicating that health and environmental risks from agrichemical use need to be reduced quickly.

EPA, as mentioned by Mr. Synar, has reported that nearly 70 pesticides cause cancer in laboratory animals with a third classified as probable human carcinogens. A host of studies over the past 5 years by EPA, the Office of Technology Assessment, the U.S. Geological Survey, and the Environmental Working Group have documented pervasiveness of pesticides and fertilizers in our food, groundwater, well water, and streams.

The NAS report also demonstrates that even residue levels well below EPA tolerances can be a problem. In response to these findings, we should certainly not stop feeding our kids fruits and vegetables. But forcing parents to make unappetizing tradeoffs between nutritional benefits on the one hand and food safety risks on the other is not an acceptable answer either.

Swift Federal action to promote major reductions in reliance on agrichemicals is a far healthier approach and is the most direct way to reduce risks and enhance public confidence. The American public could not agree more.

Public Voice's March 1993 national opinion survey on agrichemical issues shows that the public wants changes in Federal policies and changes in the way we grow and market other food.

Here are some typical findings of the survey. Roughly 70 percent said they are very concerned about the effects of agrichemicals in

our water, pesticides on the environment, and pesticides in children's foods. Sixty percent said it is very important for farmers to switch to natural methods using chemicals only as a last resort. Sixty-five percent said it is very important to have stronger Federal policies to reduce agrichemical use and 78 percent even favor shifting money from farm income subsidies to use reduction efforts.

Finally, only 24 percent felt their supermarkets carried enough foods grown with little or no chemicals. This is hardly a resounding vote of confidence for current Federal policies or food production and marketing systems.

These concerns about levels of agrichemical use are well justified. In a May 1993 report, Public Voice documented that reliance on agrichemicals has actually increased since the early 1980's. Fungicide rates grew 100 percent, herbicide rates were up 25 percent, and chemical fertilizer rates were up 10 percent. Insecticide rates managed to remain fairly constant.

The good news is that some growers are already using a minimum of chemicals or trying to reduce agrichemical use. Our 1992 survey of Wisconsin farmers for example found that 18 percent of them met our criteria for low chemical farming. This probably exceeds the U.S. average, but it definitely shows the potential for profitable low-chemical agriculture.

Nevertheless U.S. agriculture as a whole continues to lose the chemical use reduction war even as some farmers win their individual battles. This is no surprise given the list of barriers impeding agrichemical use reduction.

I want to mention just a few of them. First, research on nonchemical farming methods is years behind schedule due to a decade of neglect.

Second, Federal commodity programs continue to penalize farmers who substitute crop rotations for chemicals by reducing the acreage eligible for subsidy payments. Previous efforts to address this problem have been token gestures.

Third, marketing standards stressing cosmetic perfection can discourage fruit and vegetable growers from reducing use of pesticides. The previous administration unfortunately worked very hard to prevent even research from being conducted on this issue.

Fourth, growers who want to reduce the use of agrichemicals without going all the way to organic farming largely lack marketing incentives to do so.

Finally, a 1991 Public Voice survey of U.S. supermarkets found widespread failure to properly promote and merchandise organically grown produce, thereby needlessly limiting the expansion of organic farming opportunities.

J.B. Pratt, an Oklahoma City supermarket executive who will testify later is an obvious exception to the rule.

In closing, Mr. Chairman, I want to say that whether the administration can productively shift agrichemical policy from a paradigm based on risk management and risk communication to a paradigm dominated by risk reduction and pollution prevention will depend on whether its forthcoming initiatives are comprehensive and bold enough to sweep away these formidable obstacles.

That means the immediate reversal of policy barriers, greatly increased public investment in research, development and dissemina-

tion of alternative methods, marketing incentives for farmers and the removal of disincentives, and far more coordination and strategic planning than ever before.

Thank you.

Mr. TOWNS. Thank you, Dr. Rosenfeld.

[The prepared statement of Mr. Rosenfeld follows:]

Introduction

Good morning, Mr. Chairman. I am Allen Rosenfeld, Acting Co-Director of Public Voice for Food and Health Policy, a national nonprofit consumer advocacy and research organization working to promote a safer food supply and a more environmentally protective food production system. I am pleased to have this opportunity to present Public Voice's views on the need and opportunities for alternatives to chemical-based agriculture. Over the past four years Public Voice has released eight original reports on agrichemical use issues and has worked with Congress and the executive branch to foster policies that will encourage a substantial reduction in U.S. agriculture's reliance on chemical pesticides and fertilizers.

I want to begin by applauding your leadership in convening this much-needed hearing on the status of alternatives to chemical-based farming methods. The timing of the hearing could not be more opportune given the recent release of the National Academy of Sciences report on pesticides residues and children and the Clinton Administration's public commitment to pesticide use reduction and sustainable agriculture.

Overview of the Health and Environmental Problems Posed By Agrichemicals

With the Administration's unprecedented announcement, the terms of debate on agrichemical issues have shifted toward the need for real reductions in risks posed by agrichemicals. For decades federal policy makers have been preoccupied with risk management and risk communication. They simply took the universal dominance of agrichemicals as a given and developed policies they felt would keep risks to acceptable levels. Risk communication strategies were designed to ensure public acceptance of the risks built into the chemical-based system and were built around repetition of the claim that the U.S. has the safest food supply in the world.

Hopefully, the findings of the NAS have driven the final nail into the coffin of this outdated reactive approach. We now have official acknowledgement of what many have been saying for well over a decade, namely that existing federal pesticide policies have kept the risks to our children well above acceptable levels.

This does not mean that we should stop feeding our children fruits and vegetables or that we need to run out and horde the extremely limited supply of organically grown products. The health benefits of lifelong consumption of significant quantities of fruits and vegetables are well documented. Nonetheless, parents can be spared unappetizing tradeoffs between nutrition and food safety since we have the capacity to substantially reduce the health risks from pestioide residues.

The NAS report findings are but the latest piece of evidence indicating that the health and environmental costs from widespread agrichemical use need to be reduced as quickly as possible. EPA, for example, reports that nearly seventy pesticides registered for use on food have been shown to cause cancer in laboratory animals. About one-third of those pesticides are considered to be at least "probable human carcinogens." The recently released Environmental Working Group report not only complemented the NAS findings on risks to children, it also documented that pesticide residues in food are far more pervasive than previously admitted by federal officials. When the many sources of daily human exposure to multiple pesticides are considered, the total daily intake of these chemicals -- particularly for certain subpopulations such as young children -- is anything but negligible.

On the environmental side of the agrichemical equation, disturbing problems also persist. A 1990 EPA study of the nation's 94,000 community water system wells found that 52 percent contained nitrates and 10 percent contained pesticide residues. In a 1988 nationwide study, EPA found 46 pesticides in the groundwater of 26 states as a result of normal agricultural usage. A 1989 U.S. Geological Survey study detected pesticides in 90 percent of the streams they tested in 10 midwestern states. Moreover, scientists at the World Wildlife Fund and elsewhere are discovering that extremely small doses of certain organic chemicals, including some pesticides, are causing reproductive and developmental defects in the offspring of various animals that consume them.

A frequently heard response to this litany of problems is that the tiny levels of pesticide residues detected in food and water are below EPA tolerances and action levels and thus pose no significant health and environmental risks. This assertion simply cannot hold up to close scrutiny. For one thing, the NAS report should certainly put to rest the notion that EPA tolerances are adequately protective of public health. Even if EPA moves quickly to lower tolerances in response to the NAS report recommendations, only one piece of the risk reduction puzzle will have been put in place. The reality is that pesticide tolerance-setting based on current risk-assessment methods contains a high degree of uncertainty. Existing methods of assessing the risks from prolonged exposure to pesticide residues in food -- for all of their sophistication -- still lack scientific precision.

Public Concerns and the Need for A National Strategy To Reduce U.S. Agriculture's Reliance on Agrichemicals

The uncertainty underlying the management of risks posed by pesticide residues in food provides a compelling case for a natgional risk reduction strategy in which major declines in the use of agrichemicals play a leading role. Simply stated, the most logical and direct way to ensure humans and wildlife will not be harmed by exposure to hazardous chemical residues is to eliminate or substantially reduce use of those chemicals in the first place.

The American public wholeheartedly agrees. Last March, Public Voice commissioned a nationwide opinion survey of public attitudes toward the use of agricultural chemicals on U.S. farms. A report containing the findings of the survey, What Americans Think About Agrichemicals, was released in late April. Respondents to the survey communicated in no uncertain terms that:

- they are very concerned about the health and environmental impacts of agrichemicals;
- they very much want farmers to switch to nonchemical farming methods;
- they strongly support federal government initiatives and reallocation of resources that would lead to reductions in agrichemical use; and
- they want far more opportunities to buy foods grown with little or no chemicals in their supermarkets.

In the survey, 71 percent of respondents said they were very concerned about pesticides and fertilizers getting in our water supply and 67 percent said they were very concerned about the effects of pesticides on the environment. The strongest concern about health risks of agrichemicals was expressed about the health effects on young children, with 67 percent saying they were very concerned. Keep in mind that the survey was conducted long before the release of the NAS report.

To put matters into perspective, only 61 percent said they were very concerned about the risk of severe food poisoning from bacteria in meat, followed by 55 percent for health problems due to secondary smoke from other people's cigarettes, and 47 percent for health problems due to air pollution from cars and industries. Each of these three issues had been in the news headlines just prior to the administration of the survey.

With these levels of concern, it was no surprise to find strong support for changes in the way U.S. agriculture produces food and for federal policies that will promote agrichemical use reduction. Sixty percent of survey respondents stated that it is very important for producers to switch to farming primarily with natural methods and using chemicals only as a last resort. Support for a strong federal government role was also evident as 84 percent said it should be actively involved in encouraging farmers to significantly reduce their use of pesticides. Moreover, the public supports a reallocation of federal resources to achieve chemical-use reduction goals. For example, 78 percent said they would favor reducing the money given to farmers in income subsidies and using that money to find ways for farmers to reduce their use of chemicals.

The Public's View of the Food Marketplace: Concerns About Agrichemicals Are Not Being Addressed

Underlying much of the concern about agrichemicals was widespread discontent with the lack of access to foods produced with low-chemical farming methods. Seventy-one percent of respondents said that they would like to see their stores stock more foods produced with few or no agrichemicals. Only 24 percent believed the current selection to be adequate in this regard. To the extent that these results come close to capturing consumer demand for more options, today's food system may only be delivering half a loaf for the vast majority of Americans.

Previously unreleased results from the survey shed further light on consumers' dilemma. Seventy percent of respondents stated that labeling a product "organically grown" would make them more likely to purchase it. After all, "organically grown" foods are the virtually the only foods that communicate to consumers in the marketplace that their concerns about agrichemicals are being addressed. And these amount to only about 1-2 percent of the total retail food market. With the exception of the minute amount of foods currently certified as containing no detectable pesticide residues, there are no other options.

According to the survey, however, consumers are interested in options other than food that is "organically grown" or food produced with normal amounts of agrichemicals. With regard to organically grown foods, 63 percent strongly agreed that they would be just as satisfied with food produced using much lower levels of agrichemicals. In short, there is probably tremendous market potential for foods produced with low-chemical methods waiting to be tapped by enterprising producers, distributors and retailers.

Although Agrichemical Use Continues to Increase, Many Farmers Are Using Low-Chemical Methods

In reality there has been little overall progress in meeting the challenge posed by this potential nationwide demand for food produced with little or no agrichemicals. In a May 1993 report, Agrichemicals in America, Public Voice documented that farmers' reliance on agrichemicals since the early 1980s has actually increased!

Despite growing public concerns and increased interest on the part of farmers, food processors and retailers in pesticide use reduction, we are still not seeing the reductions on an aggregate level that many had expected. Our study indicated that average pesticide use rates increased by 125 perecent between 1966 and 1991. In the past decade, the rate of fungicide use increased by 100 percent, the rate of herbicide use increased by nearly 25 percent, and the rate of chemical fertilizer use grew by nearly 10 percent. The rate of insecticide use remained constant. On the whole, the study found that fruit and vegetable crops are by far the most intensive users of agrichemicals.

While these findings do indicate that, on average, U.S. farmers are not making much headway in responding to the public's concerns, it is clear that many individual growers and some of their buyers are succeeding in significantly reducing or eliminating their reliance on agrichemicals.

In Wisconsin, for example, a significant proportion of farmers appear to already be profitably farming with low-chemical methods. In a 1991 survey of a random sample of Wisconsin farmers -- reported in Trying to Take Root: Sustainable Agriculture in the U.S. Heartland -- Public Voice found that 18 percent of respondents met our basic criteria for a low-chemical farming system. These farms relied on chemical fertilizers, herbicides, insecticides and fungicides at most only occasionally and had implemented resource-conserving crop rotations over the previous five years.

Most of these low-chemical farms were livestock-based operations that likely produced crops primarily for on-farm feeding and had ample on-farm supplies of animal manure. Predictably, vegetable producers, whose crops tend to be heavier fertilizer users and who must meet stringent market quality standards, were easily the least likely to meet the low-chemical farming criteria. This outcome corresponds with our finding in Agrichemicals in America that, on average, fruit and vegetable crops are by far the most intensive users of agrichemicals, particularly fertilizers, insecticides and fungicides.

While fruit and vegetable operations appear to present the biggest challenges for reducing reliance on agrichemicals, they also have their fair share of success stories. Some of them are right in our own backyard. At a joint press conference with World Wildlife Fund, last May, we featured a Loudon County, Virginia vegetable grower, Chip Planck, who has profitably reduced his use of pesticides and chemical fertilizers to the barest of minimums, using them only after exhausting all possible nonchemical options.

The success stories are not limited to small family operations. A number of innovative food processors and retailers, including Gerber, Campbell Soup, and Kroger, are working with fruit and vegetable growers to employ pesticide use reduction strategies and, in some cases, to meet some type of "nondetectable residue" standard. Private certifiers on the West Coast claim that numerous growers employing pesticide reduction techniques are prepared to meet "nondetectable residue" standards for fresh fruits and vegetables should the marketing opportunities arise. Earth's Best, a rapidly growing baby food company, offers a full line of certified organically grown fruit and vegetable products. Participants in later panels at this hearing will undoubtedly provide more details about these and other success stories.

This anecdotal evidence, along with the results of Public Voice's Wisconsin farm survey, suggest that reduced-chemical, low-chemical and no-chemical agriculture can be profitable in this country. The national agrichemical use data, however, strongly indicate that the farm sector's progress in this area has been slow and very uneven. For their part, farmers appear to have ample reason and motivation to move forward. Surveys of farmers indicate that most of them would like to reduce agrichemical use for the sake of improving the safety of their own drinking water, decreasing their exposure to pesticide sprays, reducing their cash expenses, and responding to consumer concerns. On the other hand, despite the success stories and the good intentions of many farmers and food companies, most farmers still face substantial technical, financial and marketing barriers that can discourage them from reducing their reliance on agrichemicals.

Farmers Face Many Obstacles to Reducing Reliance on Agrichemicals

The R & D Gap for Nonchemical Methods

First and foremost, the supply of proven, profitable alternatives to chemical methods is far behind the obvious demand. For the vast majority of farmers who have not been at the cutting edge of the agrichemical reduction movement, substitution of nonchemical methods for the old standby chemicals must seem like a terribly risky venture. The first requirement for them to make a switch is easy access to nonchemical methods that have been demonstrated to get the job done profitably. Unfortunately, these methods, and corresponding nonchemical inputs, are, in too many instances, not available for their unique mix of crops, soils, climate and natural resource endowment.

In large part, this massive R & D gap is the result of a lack of leadership and commitment of resources on the part of Congress and successive federal administrations, particularly at the Department of Agriculture. Mandated programs focusing on the development of nonchemical alternatives have been slighted in successive federal budgets and continue to be severely underfunded.

The excellent Sustainable Agriculture Research and Education program at USDA (formerly the L.I.S.A. program), for example, currently receives less that $7 million a year to develop and demonstrate nonchemical-based farming systems. This represents only about one-half of one percent of the total federal agricultural research budget. And the Sustainable Agriculture Technology Development and Transfer Act, mandated three years ago in the 1990 Food Agriculture Conservation and Trade Act (FACTA) to train extension agents in disseminating low-chemical farming methods, is likely to be funded for the first time in FY 1994 at $3 million or only 15 percent of the authorized funding level.

In the absence of federal government leadership in the development of nonchemical methods, it is no surprise that an investment shortfall of huge proportions has been created. Agroinput companies, with their current emphasis on manufacturing and selling petrochemical products, have little incentive to develop or support the development of nonchemical methods that rely heavily on information, management skills, and labor inputs. A decade of official hostility to the development of alternatives to chemical-based farming has thus produced a cynical self-fulfilling prophecy: continued growth in agrichemical use has predictably been assured.

Disincentives in the Federal Commodity Programs

Even if effective, high-yielding nonchemical alternatives were available to all farmers, most farmers will not substitute them for chemicals unless they believe they can continue to realize their accustomed level of revenues. For many crop farmers in the nation's heartland, realized revenue is heavily dependent on federal income support payments. In turn, these "deficiency payments" are a function of the farmers' historical "base acreage" for so-called program crops, such as wheat, corn, cotton, and rice.

For farmers to maintain their base acreage at historic levels, they must continue to plant them in their program crops. Should they decide to adopt resource-conserving crop rotations -- which interrupt pest life cycles, provide a natural source of soil fertility and enhance soil structure -- they will seriously reduce the number of "base acres" they have eligible for deficiency payments. In this way, federal commodity program rules have discouraged farmers from adopting the very crop rotations that would allow them to reduce their reliance on agrichemicals.

This perverse impact of federal commodity programs was documented in the 1990 NAS report, Alternative Agriculture, and has been widely recognized for some time. Nonetheless, little has been done to remove this glaring impediment to safer food and a cleaner environment. The Integrated Farm Management Option (IFMO) authorized in the 1990 FACTA, which would allow participating farmers to adopt resource-conserving crop rotations without loss of base acres, has been woefully underfunded and effectively undermined by USDA rulemaking. As a result, few farmers have been unable to capitalize on an otherwise sound public policy.

Public Support for Environmentally Responsive Agricultural Policies

By opening and promoting the IFMO program to all farmers in the commodity programs, USDA could help close the large gap between the nation's farm income objectives, on the one hand, and its health and environmental goals, on the other. Public support for such action is likely to be strong and widespread. Although 64 percent of respondents to our national opinion survey said that they are generally in favor of helping farmers through income subsidies, 78 percent of those generally in favor of the subsidies

said they would be less likely to support them if they found out that the subsidies encouraged the use of farm chemicals.

The survey provided additional evidence that support for the current subsidy programs weakens in the face of the public's environmental concerns. Seventy percent of all respondents said they would support changing the subsidy program to ensure that the more chemicals a farmer used, the less income subsidy he/she would receive. In addition, seventy-eight percent stated that they would favor reducing the money spent on farm income subsidies if that money went to promote agrichemical use reduction.

Barriers Posed by Food Marketing Policies and Practices

Food marketing practices and policies can also play a pivotal role in discouraging reductions in reliance on agrichemicals. This can occur in two ways. First, the food marketing system provides far too few positive incentives for farmers to take the risk of reducing their reliance on agrichemicals. Secondly, and worse yet, food marketing policies, such as federal marketing order regulations, and food marketing standards emphasizing cosmetic appearance can actually hurt farmers who substantially reduce their use of pesticides.

The Lack of Positive Marketing Incentives. Earlier in my testimony I reported that although most consumers were dissatisfied with the current availability of food grown with little or no chemicals, they would be just as satisfied with food produced with much lower levels of chemicals as with organically grown food. This survey finding underscores a failure of the food marketing system not only the from the consumer's end but from the grower's end as well.

An important reason why most growers have not made risky, wholesale changes in their production practices is their lack of access to market outlets that would make it worth their while. Only the "organically grown" label, which is probably beyond the reach of the vast majority of growers, rewards growers for changing their agrichemical use by strongly differentiating their products from those grown using conventional, chemical-based farming methods.

A relatively small number of nonorganic growers have found market niches that encourage them to reduce their use of agrichemicals. Some grow fruits and vegetables for innovative food processors or retailers who demand reduced pesticide use or commodities meeting a "nondetectable residue" standard. Fewer still can sell the bulk of their products at farmers' markets or to natural food stores where the claims, "pesticide free" and "IPM grown", may attract buyers often willing to pay a premium.

Unfortunately, these niches remain the exception rather than the rule. They need to be expanded quickly and dramatically. Until we put in place a widespread system of incentives that reward substantial reductions in agrichemical use or penalize the status quo, I believe that the vast majority of U.S. growers will not risk making major changes in their practices.

Inadequate Supermarket Promotion of Organic Produce. It is important to note that being able to label a product as "organically grown" is no guarantee that growers will find expanding market opportunities for their products. In 1991, Public Voice, with the cooperation of the Food Marketing Institute and the Produce Marketing Association, surveyed a cross section of the U.S. produce wholesaling and supermarket industries. Results from the survey were released in March, 1991 in the report, On The Way To Market: Roadblocks to Reducing Pesticide Use On Produce.

Three-fourths of the respondents who handled organically grown produce sometime during the previous five years reported that although sales had increased over that five-year period, they had declined or stagnated in the most recent year. Other sources indicate, however, that sales of organically grown produce have continued to increase throughout the early 1990s. It appears that most of the growth is occurring in retail outlets other than supermarkets, such as natural food stores and food coops. In the Washington, D.C area, Safeway and Giant have recently had well-publicized failures in their attempts to carry organically grown fresh fruits and vegetables.

Other results from the supermarket survey illuminate some of the likely causes of problems with sales of organically grown produce in conventional supermarkets. For example, 62 percent of the retailers stated that they wrapped their organically grown produce in plastic to differentiate it from their nonorganic produce. Plastic packaging is a sure way to turn off the vast majority of consumers, who generally like to select each piece of produce separately, as well as those consumers who buy organically grown foods for environmental reasons.

Another key obstacle to the success of organically grown produce in conventional supermarkets is the widespread lack of investment in advertising, merchandising and promotion of the organically grown produce. Less than one-third of the retailers we surveyed did any promotion of organically grown produce beyond placing signs above the produce bins.

Without educating consumers and promoting the benefits of organically grown produce, few changes in purchasing patterns can reasonably be expected, particularly if the organically grown produce is priced slightly higher. The outstanding work of a panelist in this hearing, J. B. Pratt, the owner of an independent chain of supermarkets in Oklahoma City, should serve as an important industry model of how to merchandise and promote organically grown foods successfully in mainstream supermarkets. If

it can be done in Oklahoma City, there is no reason why it cannot be done in Washington, D.C.

Penalizing Agrichemical Use Reduction. Government policies and private sector practices that can actually penalize pesticide use reduction compound the marketing problem for growers who would like to make substantial reductions in their use of pesticides. Over the past fifteen years, evidence has accumulated suggesting that produce quality standards emphasizing cosmetic appearance can discourage farmers from reducing the number and rates of pesticide applications.

Pesticides are used not only to prevent losses in product yields but also to prevent surface blemishes. Consequently, stringent quality standards designed to enforce the production of picture-perfect produce, can compel growers to continue using pesticides at normal rates and frequencies. Those who relax their pesticide use and bring blemished produce to the marketplace will either have their produce downgraded or rejected altogether.

The problem can be compounded by those federal and state marketing orders that use cosmetic quality standards as a means of regulating the fresh market supply. In times of abundant supplies, this puts a great deal of pressure on growers to produce photogenic produce through normal pesticide use. Those truck loads of produce that fail to "make the grade" are rejected and sent to the much-lower-priced processing markets.

In recognition of the problem, Congress enacted a research and market demonstration program in the 1990 FACTA. The legislation mandated studies to analyze the relationship between quality standards and pesticide use, and to determine the extent of consumer acceptance of blemished produce when consumers are informed that it was produced with significantly lower pesticide use.

Unfortunately, the previous administration, responding to concerns of powerful produce marketing interests, fought against appropriations for the research and refused to implement it. In a letter to the Appropriations Committees, USDA even went so far as to distort the conclusions of a federally funded study mandated in the FY 1992 Appropriations Act. Although the study concluded that research was in fact needed, USDA reported the opposite to the Appropriations Committees. Despite the Bush Administration's resistance, in the FY 1993 Appropriations Act, funds were finally allocated for the Georgia Agricultural Experiment Station to begin implementing the FACTA research and market demonstration program.

The Georgia program is an important beginning. It needs to be funded by Congress on an ongoing basis and replicated at experiment stations in other fruit and vegetable producing regions. Essential to the success of the program is a reversal of the obstructionist position of USDA -- particularly the Agricultural Marketing Service (AMS).

R=96%

Initial public statements from AMS have not been encouraging. At a two-day Virginia conference on produce quality and pesticide use at the beginning of June, an AMS Fruit and Vegetable Division official gave a presentation that closely reflected the Bush Administration position on the issue. One can only hope that the AMS official did not reflect the current thinking of the Clinton Administration on this issue. At a minimum, the June 25th commitment by the Clinton Administration to promote pesticide use reduction indicates the need for a reevaluation of USDA's old position on the issue. Failure to do so would send an unfortunate business-as-usual signal.

Conclusion and Policy Recommendations

Mr. Chairman, in my testimony thus far, I have documented strong and widespread public concern about the health and environmental impact of agrichemicals, public support for federal policy changes and initiatives that encourage agrichemical use reduction, and the public's desire to have far more access to food produced with little or no chemicals. Although some farmers have successfully changed the way they grow food in response to these concerns, the aggregate data also indicate that agrichemical use continues to rise. Some farmers may be winning the battle, but the country as a whole appears to be losing the war. Standing in the way of a nationwide success story are formidable barriers, including the ones that I have discussed here today.

The Administration's recent commitment to pesticide use reduction and sustainable agriculture is a most-welcome reversal of a long-standing policy of neglect and unhelpful rhetoric. By shifting the terms of debate on the pesticide use issue, it could help open the door for a new generation of federal policies and private sector initiatives designed to be more responsive to public concerns.

The success of this venture will of course depend on whether the Administration's forthcoming policy initiatives are effective and bold enough to bring down the formidable obstacles many growers face as they weigh the risks and benefits of reducing their reliance on agrichemicals. One thing is clear from the results of our opinion survey: adopting bold initiatives to reduce farmers' reliance on agrichemicals would not only be good public policy, it would be excellent politics as well.

Public Voice believes that for the Administration's commitment to make a difference, a first-ever federal strategy for reducing the nation's reliance on agrichemicals will have to be developed. The establishment of measurable national goals for reductions in reliance on agrichemicals and the construction of an integrated, well-funded set of programs will be crucial to the successful implementation of such a plan.

The absence of such plans and goals -- in addition to a limited commitment -- prevented previous administrations from having a major impact on aggregate agrichemical use. Previous and current federal initiatives represent at best a shotgun approach and have been comprised largely of piecemeal projects that were underfunded and uncoordinated. Far too few of them focused on the development of farming systems that rely primarily on nonchemical methods. For these reasons, we believe it will take more than just a repackaging of existing federal programs to obtain serious reductions in farmers' reliance on agrichemicals.

Again, Mr. Chairman, we commend you for your leadership on these issues and look forward to working with you to ensure that the public's concerns are translated into reductions in farmers' reliance on agrichemicals.

Mr. TOWNS. Mr. Aguirre.

STATEMENT OF JOHN AGUIRRE, DIRECTOR OF FEDERAL GOVERNMENT RELATIONS, NATIONAL PROCESSORS ASSOCIATION

Mr. AGUIRRE. Thank you, Mr. Chairman. My name is John Aguirre and I am the director of Federal Government affairs for the National Food Processors Association.

In my testimony, I address the relationship of food processors to growers and the use of pesticides and efforts by the food processing industry to limit pesticide use and residues in foods. Also I will comment on questions of policy concerning pesticide use and the importance of pesticides to the economical production of foods.

As a general rule, pesticide residues in processed foods are at extremely low levels and normally not detected under routine pesticide residue monitoring. When detected, they are at very low levels, well within EPA established tolerances. This is borne out by numerous pesticide monitoring programs at both the Federal and State level as well as in industry monitoring programs.

Food processors can share in the credit for the uniformly high rate of nondetectable or low levels of pesticide residues in the food supply. The focal point of pesticide residue reduction is at the point of application in the farm field. Pesticide residue analysis requires considerable effort and is expensive, costing between $100 to $1,000 per sample so food processors would rather focus on managing the use of pesticides in the field to ensure that residues in processed foods conform to standards.

Food processors are in a difficult situation. We must meet the dual goals of providing consumers a uniformly consistent, high-quality, low-cost food product while also responding to public concerns over risks from pesticide residues. The competing pressures are intense.

Consumers expect good tasting foods devoid of weeds, bugs, bug parts, and disease damage. Farmers need pesticide chemicals to maintain an economically viable operation, and consumers would prefer no pesticide residues.

The grower and food processor incur a business risk in marketing products with detectable levels of pesticide residues. In marketing commodities or food products with these detectable levels of pesticide residues, growers and processors alike risk a substantial devaluation of their commodity or inventories of food product if there should be adverse publicity and negative public reaction to those specific pesticide residues.

The Alar apple scare is ample evidence of this risk. In an effort to manage these risks, food processors normally stipulate conditions of pesticide use in production contracts for commodities. Processors control pesticide use on contracted crops by including in contracts a pesticide clause warning against unapproved pesticide applications and distributing to each grower pesticide lists that contain prior-approved chemicals for each crop.

In addition, these contracts may include other pesticide related provisions. While the costs of pesticide use are significant for both growers and food processors, the costs of pesticide damaged commodities can be far higher. For example, many consumers will re-

ject foods that have extensive insect damage even though such damage may not affect taste. Other insect damage can be very harmful to the integrity of commodities.

A fruit worm burrowing deep into a fruit will produce considerable fruit worm excrement and expose the fruit to secondary rot organisms. Worm-damaged fruit such as tomatoes can create high costs for processors, as they must station more workers on the sorting areas of the production line to reject worm-infested products.

No simple solutions exist for most food processors or growers to eliminate the use of pesticide chemicals, but a variety of strategies and practices can minimize and in certain cases eliminate the need to use pesticides.

Some of these practices, which others today will testify to, include a reliance upon disease and pest resistant plant varieties, the use of cultural controls, scouting the fields by pest managers on a regular basis, the use of conceptual models of pest life cycles and the use of biological controls.

The food processing industry is actively looking for ways to reduce their reliance upon pesticide chemicals. From a cost perspective and in response to consumer perceptions, reducing pesticide use can make good sense.

Mr. Chairman, I want to briefly examine the concept of reducing pesticide use as a national policy. It has been stated in various policy making quarters and by certain interest groups that reducing pesticide use is a worthwhile policy goal. The premise is that if Congress and EPA and other Federal agencies could cajole, inspire or mandate farmers to reduce the use of pesticides then something worthwhile will have been accomplished.

The whole notion of reducing pesticide use as a policy in and of itself, unrelated to any other policy goals or objectives, is confusing and essentially valueless.

If Congress were to mandate tomorrow that national pesticide use should be reduced by 25 percent in the next fiscal year and that mandate was fulfilled, what would be accomplished?

If EPA or Congress adopts as policy the goal of reducing pesticide use by 25 percent, then where should this reduction take place?

Should the 25 percent reduction be evenly distributed across all categories of pesticides used or should we focus on the largest category, herbicides.

As a general observation herbicides as a category appear to present the least concern in terms of dietary risk. The regulation of pesticide use must be executed with very specific criteria in mind. Whether the policy goals is to protect human health and the environment or to enhance the profitability of farmers, our policy should be constructed with these specific objectives in mind.

The means to an improved environment, enhanced human health or higher farm profitability may mean reduced pesticide use, but we should not foreclose other viable policy responses. More important than reducing pesticide use as a broad goal is the idea that pesticides should not be used unless they are safe.

We need a pesticide regulatory system that is responsive to public concern and can quickly act to limit risk as appropriate. For this reason, NFPA supports H.R. 1627 a bill introduced by Representa-

tives Lehman, Bliley, and Rowland. I am happy to note that there are currently 106 cosponsors of this bill.

In closing, when considering pesticide legislation, I urge the members of this subcommittee to continue to have faith in the risk-benefit standard that has long guided our pesticide regulatory system. Only in the context of considering benefits can our regulators reliably make rational decisions about managing pesticide risks.

There are enormous benefits associated with the use of pesticides and clearly there are certain risks. It is incumbent upon all of us, policy makers and those in the agricultural economy to limit in sensible ways the risks associated with pesticides.

Thank you, Mr. Chairman.

Mr. TOWNS. Thank you.

[The prepared statement of Mr. Aguirre follows:]

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TESTIMONY OF JOHN AGUIRRE

U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON GOVERNMENT OPERATIONS,
THE SUBCOMMITTEE ON HUMAN RESOURCES
AND
INTERGOVERNMENTAL AFFAIRS

July 27, 1993

Mr. Chairman, my name is John Aguirre and I am the Director of Federal Government Affairs for the National Food Processors Association (NFPA).

NFPA is a scientifically and technically based association representing some 500 food companies, including most of the major processors in the United States. Our members manufacture the nation's processed-packaged fruits and vegetables, meat and poultry, seafood, juices and drinks and specialty products.

Our mission is to serve the U. S. food industry and American consumers by helping to assure the safety and wholesomeness of the food supply.

In my testimony today, I will describe the relationship of food processors to growers and the use of pesticides, and efforts by the food processing industry to limit pesticide use and residues in foods. Also, I will comment on questions of policy concerning pesticide use and the importance of pesticides to the economical production of food.

Let me first indicate that NFPA has developed a substantial data base on pesticide residues. This data base contains more than 150,000 food samples and is growing. Despite the capability to measure in parts per million and even parts per billion, we typically do not detect pesticide residues in our testing. When we do find them, residues are at extremely low levels and well below the safe tolerance levels set by the Environmental Protection Agency (EPA).

Federal and state pesticide residue monitoring programs similarly find no or very low pesticide residues in processed foods.

In 1991, the FDA in cooperation with the U.S. Department of Agriculture performed over 5,500 pesticide residue analyses on a

variety of commodities and food products, including 2,304 samples of baby foods. In the baby food samples, 94% of the samples were found to have no detectable pesticide residues. The remaining 138 occurrences were found to contain residues at trace levels far below tolerance. The survey results also showed that residues of the pesticide aldicarb, a chemical mentioned in the recently released National Research Council report on infants and children, were infrequently detected on bananas and citrus fruits: 8% of 176 samples showed trace levels at 0.19 parts per million.

FDA's pesticide residue monitoring program for FY 1991 analyzed 19,082 samples. In over half of the fruits sampled no pesticide residues were detected and for 68% of the vegetables sampled there were no detectable pesticide residues. Federal, state and private sector pesticide residue monitoring activities confirm that processed foods typically do not contain detectable levels of pesticide residues and when detected, residues are nearly always well below EPA established tolerance levels.

These data indicate that the nation's pesticide regulatory programs are remarkably effective at assuring the safety and soundness of our food supply with respect to pesticide residues. FDA's surveillance samples for domestically produced commodities found that less than 1% of the samples had over-tolerance residues and in the category of imported commodities no violative residues were found in 98% sampled. A violation rate of only 1 to 2% is remarkable for almost any regulated activity, but certainly when considering the size and complexity of our food economy.

Food processors can share in the credit for the uniformly high rate of nondetectable or low levels of pesticide residues in the food supply. Pesticide residue control must begin before food is processed. The focal point of pesticide residue reduction is at the point of application, in the farm field. Pesticide residue analysis requires considerable effort and is expensive, costing between $100 to $1,000 per sample, so food processors would rather focus on managing the use of pesticides in the field to ensure that residue levels in processed foods conform to standards.

Fortunately, the physical processes involved in the manufacture of food typically result in reduction of pesticide residues. NFPA staff researched the effects of processing operations on pesticide residues, examining the way in which product peeling, washing, blanching and processing affect residue levels. We know that the amount of removal is influenced by which chemical is used, the crop it is utilized for, and the way in which the commodity is processed. We have documented reductions in residues ranging from 66% to 99% as a result of processing operations. I have included with my testimony a copy

of a study by our Ed Elkins on the effects of processing on residues.

While food processors have confidence in our nation's regulatory institutions and believe that pesticide residues in food pose no significant dietary risk to humans, we nonetheless prefer to minimize or eliminate, where feasible, these pesticide residues. Processors must meet the dual goals of providing consumers a uniformly consistent, high quality, low cost food product while also responding to public concerns over risks from pesticide residues and concerns about the environment. The competing pressures are intense: consumers expect good tasting foods devoid of weeds, bugs or bug parts, and disease damage; farmers need pesticide chemicals to maintain an economically viable operation; and consumers would prefer no pesticide residues.

Because of these competing pressures many food processors seek to manage the type and quantity of pesticide residues in their processed commodities by actively participating in the pest management decisions made by growers. In the grower/food processor relationship both the food processor and the grower desire a quality product with minimal pesticide residue levels. Both the grower and processor incur a business risk in marketing products with detectable pesticide residue levels, despite evidence for their safety. For growers trying to sell commodities to the open market, a pesticide related food scare could result in a substantial, potentially economically threatening, devaluation of the grower's commodity. The Alar/apples scare is ample evidence of this risk. Often, food processors compound this marketing risk for farmers because processors are extremely risk averse and will refuse to accept commodities with potentially controversial pesticide residues. Processors face the same marketing risks as growers, and many food processors will reject commodities with residues of pesticides subject to EPA regulatory review for human health risks. Processors cannot afford to have their inventories of raw product or processed goods rendered unmarketable due to adverse publicity and negative public reaction to a pesticide.

In an effort to manage these risks to both commodity growers and the processor, many processors stipulate conditions of pesticide use in production contracts for commodities. Processors control pesticide use on contracted crops by: including in the contract a pesticide clause warning against unapproved pesticide applications; distributing to each grower pesticide lists that contain prior-approved chemicals on each crop; requiring that a complete record be kept of every pesticide applied to the crop; verifying that all applications to the crop comply with federal, state, and processor limitations before the crop is accepted at the plant; and, monitoring pesticide residue levels in raw and finished products.

Food processors, large and small, are constantly evaluating the success and effectiveness of their policies on pesticide use. One example is Ocean Spray Cranberries. Ocean Spray made an evaluation of the need for pesticide use on cranberries intended for processing. The company found that many of the blemishes on the cranberry fruit intended for processing have insignificant effect on the quality of the finished cranberry product. Therefore, cranberries which may be slightly damaged with scars or other minor defects are not of concern. This led to reduced pressure on the grower to apply pesticides.

However, it is important to recognize that food processors cannot dismiss entirely the sensory characteristics of the commodities they process. Food processing is not a highly profitable industry. That industry is extremely competitive all the more reason that food processors must be able to produce a uniformly consistent, high quality product.

In the eyes of the consumer, appearance is a principal determinant of quality. Tomatoes for example, can suffer sun scald if the plant is attacked by a disease that results in wilting of the tomato leaves. This results in the exposure of the tomato fruit to full sun. This exposure results in sun scald, which does not alter the taste of the tomato, but does produce inconsistent white streaks throughout the tomato that create an unappetizing appearance for the consumer. For this reason, it is important that the grower and processor prevent sun scald.

Insect damage is another component of quality standards that may have little bearing on the taste or safety of the product, but can produce obvious defects in a food product. Again, consumers will reject foods that have extensive insect damage, even though such damage may only affect appearance. However, not all insect damage is harmless. Fruit worm burrowing deep into a fruit, where they feed extensively, will produce considerable fruit worm excrement and expose the fruit to secondary rot organisms. Worm damaged fruits, such as tomatoes, can create high costs for processors as they must station more workers on the sorting areas of the production line to reject worm infested product.

In an extreme view of the issue, one could judge the food processor's intolerance for insects in processed food as nothing more than a concern over cosmetic quality. As a rule, a bug in your processed food would be entirely safe to eat--the insect along with the commodity would have both been cooked. However, army worms in tomatoes or stink bugs in peas are not acceptable to the consumer. Farmers sometimes joke that a little bit of protein wouldn't hurt anybody. This is only partly true, since this unwanted protein can adversely affect sales.

Insects or weeds in foods often produce a visceral, negative reaction on the part of the consumer and food companies cannot afford these types of complaints, especially not well established brand name food products. Consumers expect a highly appealing, tasty food every time they purchase a food product. The presence of an insect in that product can permanently disrupt a customer's willingness to make future purchases of that brand. In fact, one negative event can influence the purchasing decisions of an entire family.

An example of an insect problem would be corn borers in snap beans. Corn borers do not prefer to lay their eggs on snap beans, but they will do so when there are high numbers of them. Many of the eggs and larvae die, but the surviving larvae will tunnel into the vines of snap beans, where they cause little problem in terms of lost yield. However, based upon experience, one worm in a hundred pounds of pods can generate numerous complaints from consumers that find portions of worm in their product. Analyzing consumer complaints is a valuable means by which to judge the effectiveness of pest control strategies.

Certainly, controlling pests does not necessarily require conventional chemical pesticide strategies. Instead, many other mechanisms exist to control pests and minimize insects in foods. No simple solutions exist for most food processors or growers to eliminate the use of pesticide chemicals. However, a variety of strategies and practices can minimize, and in certain cases eliminate, the need to use pesticides. Some of these practices are listed below:

Host Plant Resistance
Disease resistance is an important factor in the selection by processors of specific varieties of crops. The availability of a broad variety of disease resistant varieties of crops has improved opportunities to produce crops earlier and later in a season, and to expand the geographic range of production for certain commodities.

Cultural Controls
Many food processing operations draw commodities from geographic regions with conditions ideally suited to producing a specific commodity. Ideal locations are characterized by high productivity and low pest pressures, thus lower pesticide use. Also, production on contracted land affords the grower greater flexibility in crop rotations, which can disrupt pest life cycles and minimize the need for pesticide use. At the processing plant, controls can be established that alleviate pest problems and complement pest control strategies in the field (i.e., use of air cleaners to remove stinkbugs from peas).

Monitoring
Scouting of fields by pest managers on a regular basis provides

information on pest life cycles, distribution, and damage that permits greater rationalization and effectiveness of pesticide use. Monitoring of pests through trapping techniques can also define when pest populations reach economically meaningful levels, allowing growers to avoid applying pesticides prematurely and unnecessarily.

Modeling
Conceptual models of pest life cycles aid in targeting (and limiting) pest use to those time frames when pesticide applications are most effective. For example, a predictive model has been developed for white mold in green beans. This model forecasts white mold infection and suggests when prophylactic sprays are needed. Similarly, a model developed for peas has been developed that allows a grower to time a pesticide application to the emergence of the pea aphid into its winged stage of life.

Biological Controls
Pest control strategies that consider preserving predator or parasite populations, so-called beneficials, to control target pests mean that nonchemical pest controls can complement chemical control strategies. Also, the direct introduction of these beneficials can sometimes supplant chemical pesticide applications. The use of microbial controls for pea and bean root rot may replace the need to treat seeds with fungicides prior to planting.

The food processing industry is actively looking for ways to reduce the reliance upon pesticide chemicals. From a cost perspective and in response to consumer perceptions, reducing pesticide use can make good sense. However, the agricultural economy of the country is extremely complicated and the success and failure of various systems of agricultural production is characterized by geography, climate, and the presence or absence of pests. The conditions and factors that define the successful production of Georgia peaches may have little meaning to the producer of California peaches. Apple production in Washington or Idaho is a distinctly different enterprise than apple production in Virginia or Pennsylvania.

For these reasons, Congress and our regulatory institutions must avoid a one size fits all approach to pesticide regulation. Our national pesticide policies must be flexible and sensitive to the very specific local conditions that characterize agricultural production.

Mr. Chairman, I want to examine the concept of reducing pesticide use as national policy. It has been stated in various policy making quarters, and by certain interest groups, that reducing pesticide use is a worthwhile policy goal. The premise is that if Congress, or EPA and other federal agencies could

cajole, inspire or mandate farmers to reduce the use of pesticides, then something worthwhile will have been accomplished. Specific numerical goals have been mentioned in the area of 10%, 25% or 50%.

The whole notion of reducing pesticide use as a policy in and of itself is confusing and essentially valueless. If Congress were to mandate tomorrow that national pesticide use should be reduced by 25% in FY 1994, and that mandate were fulfilled, what would we be accomplished? I don't know.

Before discussing further my concerns with such policy, let me briefly characterize agricultural pesticide usage in this country. There are approximately 2.1 million farms in the United States, 991 million acres of farm land, with about 289 million under active cultivation. According to 1987 farm census data, 913,000 farms reported using pesticides to control weeds, grasses, and brush, and 554,000 farms reported using pesticides to control insects on hay and other crops. In addition, 270,000 farms reported using pesticides to control crop diseases and nematodes, and as defoliants or for fruit thinning.

The bulk of agricultural pesticide use consists of herbicide applications. The two leading pesticides by volume of use are atrazine and alachlor, both herbicides. For 1992, EPA reported that herbicide applications accounted for a little more than 60% of the total volume of pesticides used in agricultural production. Next came insecticides representing 21% of the total used and the remainder was represented by fungicides, nematicides and other types of pesticides.

If EPA or Congress adopts as policy the goal of reducing pesticide usage by 25%, then where should this reduction take place? Should the 25% reduction be evenly distributed across all categories of pesticides used, or should we focus on the largest category, herbicides? In 1982 430 million pounds of herbicide active ingredient were applied for agricultural purposes and in 1984 that figure jumped 21% to 545 million pounds of herbicide active ingredient. Were Americans or the environment better off because herbicide use in 1982 was 21% lower than in 1984. Similarly, farmers applied 175 million pounds of insecticide active ingredient in 1991, which was 44% less than the 309 million pounds of insecticide active ingredient applied in 1981. Are Americans and the environment 44% better off? I don't know

The regulation of pesticide use must be executed with very specific criteria in mind. Whether the policy goal is to protect human health and the environment, or to enhance the profitability of farmers, then our policies should be constructed with these specific objectives in mind.

If there are concerns about groundwater contamination or

surface water quality, then those pesticides that tend to leach into groundwater or run into our streams, rivers and lakes should be managed accordingly. Perhaps the solution is reducing pesticide use. But, it could also be the use of buffer strips around fields bordering on streams and rivers, or restricting aerial applications to minimize drift in favor of more targeted in-furrow applications with a tractor towed spray rig, and geographic or temporal restrictions on pesticide use may be appropriate for vulnerable watersheds and to minimize run-off during the wettest times of the season.

Likewise, if the use of a pesticide poses an unacceptable risk to birds or endangered species, then our regulatory system should focus on how to minimize that risk.

Since the manufacturer of aldicarb discontinued its use for potatoes until certain questions regarding residue levels and their health implications were resolved, potato farmers have had to rely upon less effective alternative pesticides and increase by an additional five or six the number of applications. So, the loss of aldicarb due to one set of concerns raises another set of concerns. Are we better off when farmers must use more of less effective pesticides?

If Congress and the EPA embrace a policy of reduced pesticide use, then what happens to the use of sulfur as a fungicide in organic agricultural production systems. Sulfur has to be applied at far higher rates than other synthetic chemical fungicides. In the report by the National Research Council (an arm of the National Academy of Sciences) on alternative agriculture, a California organic grower of grapes reported applying sulfur 7 to 14 times during a growing season, at a rate of 5 to 12 pounds of sulfur per acre, per application. This grower could easily end up applying over 100 pounds of sulfur per acre during a growing season. A conventional grower of grapes could apply new synthetic fungicides at a rate of only ounces per acre, or older fungicides at a rate of a couple of pounds per acre and less frequently than required for sulfur. How does the high rate of sulfur use square with the policy goal of reduced pesticide use?

More important than reducing pesticide use as a broad goal is the idea that pesticides should not be used unless they are safe. We need a pesticide regulatory system that is responsive to public concerns and can quickly act to limit risks as appropriate. For this reason NFPA supports H.R. 1627, a bill introduced by Representatives Lehman, Bliley, and Rowland. I'm happy to note, Mr. Chairman, that you along with 105 of your colleagues have co-sponsored this bill.

A central element of H.R. 1627 is the proposed reform of the Delaney clause as it applies to the regulation of pesticide

residues. The Delaney clause is a highly inflexible provision of law that has prevented the EPA from exercising its discretion. The introduction of newer pesticides that may be very slightly carcinogenic, but offer many advantages in terms of lower risks to humans and the environment than other noncarcinogenic chemicals on the market can be precluded by the Delaney clause. I modernization of the Delaney clause is the single most important reform needed today.

H.R. 1627 offers many valuable improvements to our pesticide regulatory system. NFPA's member companies believe pesticides in the food supply represent no significant risk to the health of American consumers. However, there is always room to improve and we believe that the regulatory system can be changed, at minimal cost to consumers, farmers and processors, to better safeguard the food supply from the already low risks posed by pesticides.

When considering pesticide legislation, I urge the members of this subcommittee to continue to have faith in the risk-benefit standard that has long guided our regulatory system. Only in the context of benefits can our regulators make rational decisions about managing pesticide risks. There are enormous benefits associated with the use of pesticides, and clearly there are certain risks. It is incumbent upon all of us--policymakers and those in the agricultural economy--to limit in sensible ways the risks associated with pesticides.

In summary, I want to emphasize that the management of pesticide use and residues in food must be the function of the very specific objectives. Broad mandates to reduce the use of pesticides may accomplish little of value, or even be counterproductive to public health and the environment. It is important to recognize that farmers do not like to don chemical suits and hop on their tractors to apply pesticides. It's costly and farmers correctly perceive that many pesticides may present relatively high risks to applicators. Farmers will adopt less chemical intensive pest control strategies provided these strategies are effective, contribute to profits, and recognize the constraints on the farm managers time.

Our system of agricultural production and food processing has served the American public very well. The debate over pesticide policy is appropriate, as we can--and should--continue to refine and improve the pesticide regulatory process.

Effect of Commercial Processing on Pesticide Residues in Selected Fruits and Vegetables

EDGAR R. ELKINS
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Commercial food processing operations such as washing, blanching, and cooking remove major portions of the pesticide residues that are currently permitted on the raw agricultural crop. These unit operations are reviewed for selected products, along with degree of residue removal at each step. For example, washing plus peeling removes 99% of carbaryl and malathion residues from tomatoes. Washing removes 83% of benomyl residue from tomatoes and further processing reduces the residue by 98% in tomato puree and catsup. Even in the most concentrated fraction from tomatoes (tomato paste), residues were below the initial level in the raw product.

The National Food Processors Association (NFPA) has long been interested in the effect of commercial processing on pesticide residues in foods. NFPA, a scientific, technically based trade association, represents nearly 600 companies including most of the major food processing companies in the United States. Approximately 450 of these companies are involved in processing fruits, vegetables, meats, fish, and specialty items, using canning, freezing, aseptic treatment, concentration, dehydration, and pickling as preservation methods. Simply put, the mission of NFPA is "To serve the food processing industry and consumers by helping to assure the safety, wholesomeness, and nutritional value of the nation's food supply."

A June 1987 report from the National Academy of Sciences on regulating pesticides in food suggests that many oncogenic pesticides concentrate in processed foods. Information is presented here to show that processing almost always considerably reduces residue levels.

However, residue control begins even before processing. We believe that the "focal point for controlling pesticide residues is at the point of application." Residue analysis of the final product requires significant analytical effort and the expenditure of large amounts of money. When the product is in the package and ready for shipment to the market, it is too late to exercise *preventive* residue control measures. For that reason, since 1960 the food processing industry has utilized the NFPA Protective Screen Program. The objective of this program is the prevention of illegal or unnecessary residues in processed foods. The program, a set of detailed recommendations that have evolved from more than 25 years of experience in the operation of active programs for the prevention of illegal and unnecessary residues, is published each year in *The Almanac of the Canning, Freezing and Preserving Industry* (James J. Judge Inc., Westminster, MD). The collection and analysis of samples is designed to verify that these preventive measures are working.

Presented at the Symposium on Pesticides in Foods: Coping with the Issue—Programs and Analytical Methods, 102nd AOAC Annual International Meeting, Aug. 29–Sept. 1, 1988, Palm Beach, FL.

Unit Operations that Remove Pesticide Residues

Recovery of the edible portion of a vegetable or fruit may involve husking, peeling, or shelling operations which effectively remove most of the pesticide with the discarded portions of the plant. Peas and corn are examples of products in which pesticides seldom if ever come into contact with the edible portion.

On arrival at the canning plant, the product is subjected to several immersion or spray washing operations which sometimes involve use of a detergent to aid in cleaning. Blanching is a short treatment in hot water or steam applied to most vegetables such as peas, green beans, spinach, and broccoli. Washing and blanching may remove much of the pesticide residue. Most fruits are subjected to peeling or juice extraction. The peel and extracted plant material constitute a major portion of the solid waste resulting from procedures applied within the canning plant itself.

Filling and closing are of no significance in connection with the pesticide residue content, except for the diluting effect of the added syrup or brine. The heat process itself is ordinarily carried out on the closed and sealed container and could be expected to result in substantial destruction of compounds subject to hydrolysis and heat effects. Some pesticides, if present at the time of retorting or cooking, will leave trace amounts of their degradation products. For example, captan will degrade to THPI, daminozide to UDMH, and the ethylenebisdithiocarbamates to ethylenethiourea. The goal of the processor is to have no parent compound present at the time of heat processing so that degradation products of concern will not be formed.

Pesticide Removal by Washing

The extent to which pesticide residues are removed by commercial washing depends on a variety of factors, such as the chemical properties of the pesticide, the nature of the food commodity, the length of time the compound has been in contact with the food, and the formulation in which the pesticide was applied. Another factor that is often overlooked is whether it has rained since the last application. If it has rained, residues on the raw agricultural commodity may be quite low, but if it has not, residues could be quite high. Table 1 shows current tolerances for malathion, parathion, carbaryl, diazinon, benomyl, and maneb on tomatoes, spinach, and broccoli.

Figure 1 shows the effect of washing on carbaryl on tomatoes, spinach, and broccoli and on diazinon on tomatoes and spinach. Figure 2 shows the effect of washing on malathion on tomatoes and parathion on spinach and broccoli. These data were all obtained in field-treated products.

Table 1. Current U.S. tolerances for selected pesticides (parts per million)

Pesticide	Tomatoes	Spinach	Broccoli
Malathion	8	8	5
Parathion	1	1	1
Carbaryl	10	12	10
Diazinon	0.75	0.7	—[a]
Benomyl	5	0.2	0.2
Maneb	4	10	10

[a] Not registered for use on this crop.

Several detergents have been accepted for use as aids in washing products in preparation for canning (Figure 3). Detergents were significantly beneficial in increasing removal of parathion from spinach and broccoli.

Carbaryl was easily removed by washing from tomatoes (97%), from spinach (87%), and from broccoli (77%). Washing removed 88% of the diazinon residue from tomatoes, whereas an 11% increase was shown for spinach (Figure 1). The broad-leaf nature of the crop may be partly responsible for the difficulty of removing diazinon. However, these results are expressed on a dry weight basis, which in some cases can lead to an apparent increase in the residue and tends to lower the value for percent removed. Figure 2 shows that washing removed 95% of the malathion residue from tomatoes but only 9% of the parathion from spinach; the parathion residue on broccoli was increased by 11%.

The effect of washing on benomyl residues was as follows: for tomatoes ($n = 5$): unwashed, 1.76 ppm; washed, 0.31 ppm; removed, 82%. For oranges: unwashed, 3.28 ppm; washed, 0.75 ppm; removed, 77%. For apples ($n = 7$): unwashed, 1.06 ppm, washed, 0.89 ppm; removed, 16%.

The effect of washing on maneb residues was as follows: for leafy greens: unwashed, 23.0 ppm; washed, 6 ppm; removed, 73.9%. For spinach, first run: unwashed, 1.13 ppm; washed, 0.3 ppm; removed, 73.5%. For spinach, second run: unwashed, 23.1 ppm; washed, 2.5 ppm; removed, 94.3%.

The tolerance for maneb on leafy greens is 10 ppm before washing and, unlike any other commodity, 10 ppm on spinach after washing. The initial residue (23 ppm) is high but normal for this pesticide and this product, and may have been due to the absence of rain after the last application of maneb. Thorough washing is a very important step in processing spinach and leafy greens. Two types of washers are used. One is an immersion washer in which the greens are immersed and propelled through a tank of water by paddles, with considerable agitation. The other, a rotary-type washer, is a long reel equipped with even-speed, high-pressure water

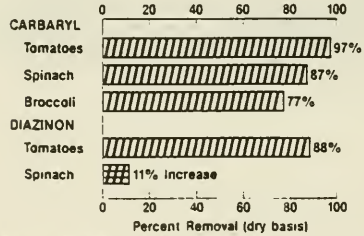

Figure 1. Pesticide removal by water washing: carbaryl and diazinon.

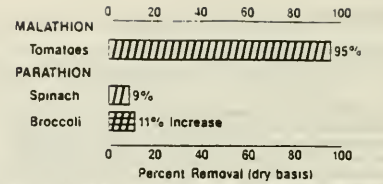

Figure 2. Pesticide removal by water washing: malathion and parathion.

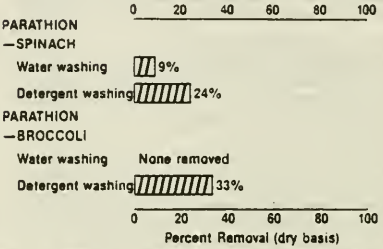

Figure 3. Effect of detergents as aids in pesticide residue removal.

sprays. The most efficient method of washing includes the use of both washers in series with the immersion washer first. At least 2 or 3 washings are necessary when processing greens.

Figure 4 shows pesticide removal by washing plus blanching for carbaryl and parathion. Removal of carbaryl from green beans by blanching only was 68%. Actually, green beans are washed and blanched at the same time. Total removal of carbaryl by washing and blanching was 97% from spinach and 98% from broccoli. Blanching alone removed 60% of the diazinon residue from spinach. It should be recalled that diazinon residues increased by 11% during washing.

Figure 5 shows 71% removal of malathion from green beans by blanching and parathion from spinach by washing and blanching. Blanching alone removed 10% of the parathion residue from broccoli.

Pesticide Removal by Washing, Blanching, and Processing

The effect of washing plus blanching on maneb residues on leafy greens was as follows: raw greens, 23 ppm; washed greens, 6 ppm, removed, 73.9%; blanched and frozen greens, 1.13 ppm, total removed, 95.1%.

Although turnip greens are canned, these experiments include freezing only. Commercial processing removed 95.1% of the original maneb residue.

The effect of washing, blanching, and canning on maneb residues on spinach was as follows: first run: unwashed, 1.13 ppm; washed, 0.3 ppm; blanched and canned, 0.05 ppm; removed, 100%. Second run: unwashed, 23.1 ppm; washed, 2.5 ppm; blanched and canned, 0.2 ppm; removed, 99.6%. Actually, virtually all the maneb residue is removed by canning. However, if any maneb residue is left after washing and blanching, the heat treatment will degrade it to ethylenethiourea (ETU).

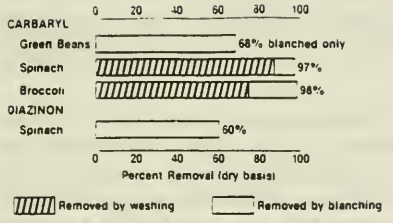

Figure 4. Pesticide removal by washing plus blanching: carbaryl and diazinon.

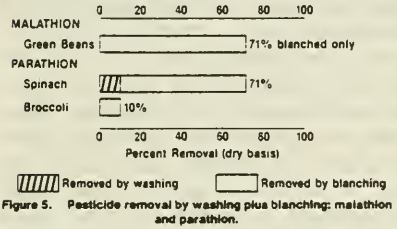

Figure 5. Pesticide removal by washing plus blanching: malathion and parathion.

Effect on ETU residues: first run: unwashed, 0.06 ppm; washed, 0.09 ppm; blanched and canned, 1.1 ppm; increase, 94.5%. Second run: unwashed, 0.01 ppm; washed, 0.01 ppm; blanched and canned, 0.16 ppm; increase, 87.5%. Third run: unwashed, 0.7 ppm; washed, 0.04 ppm; blanched and canned, 0.54 ppm; removed, 23%. Note that some ETU is present on the raw agricultural commodity before washing. Run 1 was made on leafy greens that were not canned; the 1.1 ppm of ETU was the result of cooking the frozen turnip greens in a saucepan, which increased the ETU residue by 94.5%. The increase in ETU was due to degradation of the maneb present on the product at time of heat treatment. Run 3 shows a reduction in ETU, but this is due to the large amount that was present on the raw agricultural commodity before washing; 23.1 ppm of maneb was present on the raw spinach, and washing reduced the concentration to 2.5 ppm. Blanching and canning degraded the maneb to ETU, reducing the residue to 0.54 ppm.

Effect of processing on benomyl residues in tomato products was as follows: For tomatoes: unwashed, 1.76 ppm; washed, 0.31 ppm; removal, 82%. For juice: processed, 0.25 ppm; removed, 86%. For catsup: processed, 0.03 ppm; total removed, 98%.

Benomyl is removed from oranges during processing into juice, molasses, and orange oil. Of the initial 3.28 ppm benomyl residue, 98% was removed by processing into juice, 90% by processing into molasses, and 23% by processing into oil.

Benomyl is removed from apples processed into juice, sauce, and slices. Washing removed 16% of the 1.06 ppm residue; 71% was removed in preparation of juice, 83% by processing into applesauce, and 91% by processing into slices.

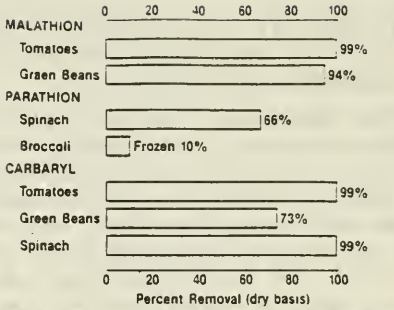

Figure 6. Pesticide removal by washing plus blanching plus canning.

Table 2. Residue content of tomatoes and tomato waste

Product	Malathion, ppm	Carbaryl, ppm
Unwashed	15.9	5.2
Washed	0.8	0.14
Peeled	0.1	trece
Waste	5.3	0.1

Figure 6 shows pesticide removal by washing plus blanching plus canning. These operations removed 99% of the malathion from tomatoes and 94% from green beans. Of the initial parathion residue, 66% is removed from spinach but only 10% from broccoli; 99% of the carbaryl residue is removed from tomatoes and spinach and 73% from green beans.

The data on the residue content of tomatoes and tomato wastes (Table 2) indicate the kind of distribution that may occur in the waste from the processing and washing of fruits and vegetables. Malathion tends to concentrate in the peel or waste, while carbaryl, a fairly polar compound, is easily removed by washing. Carbaryl does not tend to concentrate in waste material.

Summary

As the information presented in this paper shows, canning plant operations remove most of the pesticide residues present on crops received for processing. The percentage removed varies; it depends on the nature of the crop, the pesticide and its formulation, and the weathering history. Many of the processing steps involved reduce residue levels by more than 90%. Steps such as concentration, dehydration and extraction occur after the residue level from the raw product has already been significantly reduced. The net influence of processing almost always results in residue levels in processed foods well below the tolerance for the raw product; this includes the systemic pesticides as well.

Finally, careful attention should be given to the concepts described in the NFPA Protective Screen Program to assure that desired residue levels are achieved in the food supply without the costs associated with excessive final product monitoring.

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Mr. TOWNS. Mr. Gardner.

STATEMENT OF SHERWIN GARDNER, SENIOR VICE PRESIDENT OF SCIENCE AND TECHNOLOGY, GROCERY MANUFACTURERS OF AMERICA

Mr. GARDNER. Thank you, Mr. Chairman and members of the subcommittee. I am Sherwin Gardner, senior vice president for science and technology of the Grocery Manufacturers of America.

GMA is an 85-year-old national trade association comprised of over 130 companies which manufacture approximately 85 percent of the branded packaged foods sold at retail in the United States.

GMA and its members have a deep interest in food safety and have actively participated in congressional and executive branch activities to reform and strengthen our food safety laws. Our members whose branded products are in the marketplace and in front of the public every day have a vested interest in ensuring that their products are in fact safe and also are perceived as being safe.

Questions about the safety of branded products can have an enormous impact in the marketplace. Over the years, there have been a number of instances where pesticide residue on food have been identified as known or suspected carcinogens because of new or suspected scientific findings.

It is not necessary to recite each instance of a pesticide residue issue to make the point, the point being that food manufacturers are well aware of the problems that can be caused by new scientific findings about the safety of agricultural chemicals.

Food safety matters are taken very seriously by manufacturers and the food industry has invested extensive resources in quality assurance systems to ensure that food sold to consumers meet or exceeds the safety standards established by the Food and Drug Administration, the EPA, and the U.S. Department of Agriculture.

There are two very important tools that are used to ensure that the manufacture of foods are free of detectable residues. One is integrated pest management and the second is comprehensive quality assurance, which includes grower controls over pesticide use.

Both of these tools are founded on the principle that prevention of residues in food ingredients is the best approach in terms of consumer protection and production economics. It is after all food manufacturers and producers who have the primary role of ensuring that foods are safe. Government agencies establish safety standards, but it is through the efforts of manufacturers and producers that those standards are implemented on a daily basis.

There are two other points that I should like to address now. One is adequacy of the current regulatory system and second, the conclusions of the NAS report on pesticides in children's foods.

With regard to the regulatory system, GMA supports changes in the pesticide law as reflected in H.R. 1627 known as the Lehman, Bliley, Rowland bill. This bill would make a number of changes that would make the regulatory process for pesticides more responsive to the needs of consumers and producers.

With regard to NAS report this has been mischaracterized by some. However, it makes no recommendations about reducing pesticide use nor that levels of pesticide residues in foods are too great. Neither does it make any overall assessments about the safe-

ty of the food supply. What it does do is to make certain recommendations and regulatory practice having to do with the improvement of the exposure database and risk estimation techniques for children.

We support the recommendations of the NAS report for more consumption and exposure data and improved toxicity testing techniques. Improvements of the science base on which pesticide regulatory decisions are made is to everyone's benefit.

Mr. Chairman that concludes my remarks at this time and I thank you for your attention and the opportunity to present our views this morning.

[The prepared statement of Mr. Gardner follows:]

Statement of
Sherwin Gardner
Senior Vice President, Science and Technology
Grocery Manufacturers of America, Inc.

Mr. Chairman and Members of the Subcommittee on Human Resources and Intergovernmental Relations, I am Sherwin Gardner, Senior Vice President for Science and Technology of the Grocery Manufacturers of America. Inc. (GMA). GMA is an 85 year old national trade association comprised of over 130 companies which manufacture approximately 85% of the packaged foods sold at retail in the United States.

GMA has a deep interest in food safety, and has actively participated in Congressional and executive branch activities to reform and strengthen our food safety laws. Our members, whose branded products are in the market place and in front of the public every day, have a vested interest in ensuring that their products are in fact safe and also are perceived as being safe. Questions about the safety of branded products can have an enormous economic impact in the marketplace.

Few of us today remember when the pesticide aminotriazole was implicated as a carcinogen back in 1959. That resulted in the great Cranberry scare, because that was the popular food on which aminotriazole was used --and the findings about it surfaced just at the Thanksgiving season, resulting in the loss of sales for that year. Since then we have had other highly publicized stories about the residues on widely consumed foods of other suspected carcinogenic pesticides:

-in 1983, it was Ethylene dibromide, a fumigant widely used on grains, including wheat and corn. State regulatory agencies issued public health warnings and were recalling foods from the market place. Sales of some products dropped by more than 25% because of safety concerns; these losses continued for months before public confidence was restored.

-in 1989, it was Alar on apples, a story that most of us are familiar with. Newspapers were full of stories about consumers throwing out fresh and processed apple products; and sales of these products were greatly reduced.

There have been others, but it's not necessary to recite each instance of a pesticide residue issue to make the point--That food manufacturers are well aware of the problems that can be caused by new scientific findings about the safety of agricultural use chemicals.

There are of course other contaminants that may occur inadvertently in foods, including industrial chemicals and microbiological hazards such as salmonella and listeria. These food safety matters are taken very seriously by manufacturers, and the food industry has invested extensive resources in quality assurance systems to ensure that foods sold to consumers meet or exceed the safety standards established by the Food and Drug Administration, the EPA and the USDA.

There are two very important tools that are used to ensure the manufacture of foods that are free of detectable residues:

- integrated pest management (IPM)
- comprehensive quality assurance

Both of these are founded on the principle that prevention of residues in food ingredients is the best approach in terms of consumer protection and production economics.

Integrated pest management is a production tool that the GMA supports. It is designed to minimize the use of pesticides by combining the selective use of pesticides with non-pesticide agricultural techniques. IPM is a management system that seeks to anticipate and prevent pests from reaching damaging levels by the use of all suitable techniques, such as pest resistant plants, and natural insect predators.

The term quality assurance embraces a wide range of activities and concerns, primarily concerned with ensuring that foods are safe and of high nutritional quality. It begins with product conceptualization and continues with the selection and purchasing of raw materials, training of plant operations personnel, and through to the packaging distribution and marketing of products.

It is, after all, food manufacturers and producers who have the primary role of ensuring that foods are safe. Government agencies establish safety standards, but is through the efforts of manufacturers and producers that those standards are implemented on a daily basis. Quality assurance encompasses the development, organization and implementation of activities directed at ensuring and improving the safety and quality of food products. Quality assurance programs today are designed with particular emphasis on the use of Hazard Analysis and Critical Control Point (HACCP) techniques, an approach which the food industry developed and voluntarily adopted on a broad scale during the past 20 years. This approach consists of several elements:

-conducting a hazard analysis to identify hazards and the needed controls
-identifying critical control points
-establishing limits for each control point
-establishing monitoring procedures
-establishing corrective action procedures
-establishing verification procedures to ensure that corrective steps have been taken
-establishing appropriate documentation and audit procedures

Training is an essential element of HACCP and of all the operating activities involved in producing safe, high quality food. All those employed in food production must be thoroughly trained in their responsibilities to achieve this result.

Of particular importance in the matter of pesticide residues, supplier controls are essential to the production and marketing of safe food. Manufacturers must and do assure that

their ingredient suppliers conform to strict specifications. This is done by contractual arrangements, and is verified by a strong system of testing and also, in many instances, by on site inspections of suppliers. Food manufacturers do more testing for pesticide residues than all government agencies, federal and state combined; the recently issued National Academy of Sciences (NAS) report on pesticides in childrens' foods described these residue monitoring activities of food manufacturers and government agencies. Indeed, a limited survey of GMA members in 1990 showed that the annual costs of residue monitoring tests in food ingredients ranged from $10,000 to $1, 500, 000 per company, depending on the product line.

Most importantly, testing for pesticide residues is carried out primarily at the beginning of the manufacturing process to ensure that safety is built into a product; safety cannot be tested into a product during or after its manufacture. Besides the safety requirements established by governments, manufacturers have an investment in their product identities--brand names--that they naturally wish to protect. It is in their interest to install and operate the controls that ensure that their products do indeed continually meet consumer expectations of safety.

The objective of all quality assurance systems used by food manufacturers and processors is to produce safe food products that meet manufacturers' predetermined specifications, including the safety requirements established by government agencies. Preventing unsafe foods from reaching the marketplace is essential both to the health of consumers and the manufacturing companies that serve them.

There are two final points we should like to address: 1)the adequacy of the current regulatory system; and 2) the conclusions of the NAS report on pesticides in children's foods. With regard to the regulatory system, GMA is supporting changes in the pesticide law as reflected in H.R. 1627, the Lehman-Bliley-Rowland bill. This bill directs EPA to consider exposure levels of infants and children in setting pesticide residure tolerances. It also provides a uniform negligible risk standard for raw and processed foods, as recommended by another NAS report in 1987, promotes IPM techniques and makes a number of other changes that would make the regulatory process for pesticides more responsive to the needs of consumers and producers.

With regard to the NAS report, this has been mischaracterized by some; however, it makes no recommendations about reducing pesticide use nor that levels of pesticide residues in food are too great. Neither does it make any overall assessment about the safety of the food supply. What is does do is to make certain recommendations in regulatory practice, having to do with the improvement of the exposure data base and risk estimation techniques for children. We support the recommendations of the NAS report for more consumption and exposure data, and improved toxicity testing techniques. Improvement of the science base on which pesticide regulatory decisions are made is to everyone's benefit.

Mr. Chairman, that concludes my prepared statement. We appreciate the opportunity to present our views on reducing pesticide residues in the food supply.

govops
mfr control activities

Mr. TOWNS. Let me thank you, too, for your testimony. Thank all of you for your testimony.

Let me begin by raising this with all three of you very quickly. Is this issue really an either/or choice that either we continue the current level of pesticide use or reduce the food supply and raise prices?

Dr. Rosenfeld, let me start with you.

Dr. ROSENFELD. I don't think that is the case at all. The studies that we have done, particularly the study of Wisconsin farmers, indicate that a sizable proportion of them have already switched to low-chemical farming methods and are doing it profitably. In this case, they are obviously having their cake and eating it, too; they are getting the reduction in chemical use that satisfies their objectives of reducing pesticide residues in food and the water supply, protecting their own families with regard to their water, et cetera.

It is unfortunate that for years, as this issue has proceeded along, we have been forced into a debate in an either/or situation that says that if you take our pesticides and other chemicals from the system, you are going to immediately bring about the collapse of the food system as we know it, there will be food shortages, higher prices and so on. I don't think the data shows that. I know that those people you have testifying later will add to the anecdotal evidence of profitable farming using reduced and low-chemical methods.

Mr. AGUIRRE. I don't believe that it is an either/or situation. However, it is important to recognize that the loss of certain pesticide chemicals can result in increased food costs in very specific sectors.

For example, the use of benomyl on rice, that chemical is the only effective control available to control the rice disease, rice blast, and the loss of that chemical will mean a loss to the rice industry of $85 million annually.

Herbicide use has been a tremendous device for farmers and has allowed farmers to save on labor and to massively increase their productivity. If we are going to reduce pesticide use or eliminate certain pesticides, we need to be aware that certain responses in the agricultural system to that action may not necessarily be desirable.

For example, if you move production of certain commodities to more arid regions of the country and require irrigation, there are certain environmental costs. If you use plastic mulch to suppress weeds, there are certain environmental costs associated with using massive amounts of plastic mulch and having to dispose of that plastic mulch. So it is a complicated system with no simple answers.

Mr. GARDNER. I agree it is not an either/or choice. There is, however, a need for continued use of some level of pesticides, given the scale on which agriculture is practiced in this country. The enormous amount of product that is produced, coupled with the extreme variety in growing conditions, does require that pesticides be used to make our growing process efficient; and that is, after all, necessary if we are going to supply food at affordable prices to many people.

However, it also makes good management sense to be more selective in the use of pesticides when we have those options in front of us. It does save money, it does help the environment; and that is one of the reasons why the membership of GMA is supportive of the use of integrated pest management.

Mr. TOWNS. Thank you. What would be the cost in terms of public health if we do not begin to eliminate pesticides residues in our food supply? What do you feel will take place if we do not bring this under control?

Mr. ROSENFELD. Clearly when you are talking about pesticide residues in the food supply, you are talking about chronic health effects that don't leave bodies in the streets. If we are looking for body counts, we are not going to find them.

It is very difficult, if not impossible, to determine how many cases of cancer that we have in this country each year are caused by pesticide residues in food. However, we do know that something like 67 to 70 pesticides that are currently used and registered for use in food can cause cancer in laboratory animals; about 25 are probable human carcinogens, and research that is currently being done on wildlife, we are finding that even very, very low levels of residues of noncarcinogens are causing developmental and reproductive effects in the offspring of the animals that were exposed to them.

The research isn't completed yet and needs to proceed on with regard to effect on human beings. We need to extrapolate from that kind of evidence into what might happen for human beings. As a result, consumer and environmental community representatives like Public Voice have argued it is better to take a better-safe-than-sorry and a rather conservative consumer protection orientation, rather than assume there will be no problem at all because we don't have bodies in streets.

Mr. TOWNS. Thank you.

Mr. Horn.

Mr. HORN. Thank you, Mr. Chairman.

Mr. Rosenfeld, you mentioned the policy barriers that exist in the field. What is your thinking as to the bureaucratic institutional—perhaps organizational—barriers that might exist? If you could wave a wand, how would you deal with the processing of information to come to some regulatory judgment?

Is our processing adequate? Should we do something else? This is a committee on Government operations.

Mr. ROSENFELD. As I mentioned in my prepared statement, as well as in the lengthier testimony that I submitted, it is not a question of putting together a patchwork of existing programs. We can't just take programs off the shelf and dust them off and say that we are going to plug them in now and in this way the administration is going to be able to meet its goals that it recently announced to reduce pesticide use and reduce the risks therefrom.

I think we need a thorough going-over of the institutions in government that are involved in these kinds of issues, particularly with regard to use reduction issues—and that would include EPA, USDA, and FDA—and we need to devise a new national strategy with emphasis on the phasing out of the worst of the hazardous

chemicals in an orderly fashion and their replacement with nonchemical methods.

The nonchemical methods go from those that rely strictly on information and management skills, to crop rotations, some biopesticides that are now being developed that aren't chemical pesticides, and so on. The options are out there.

We have never had a national commitment, a national strategy and a set of measurable goals that we can reach, so as a result there is no direction in the Government now that would allow us to achieve chemical use reduction on the scale that we are talking about.

Mr. HORN. I think that is a good suggestion. Would you suggest as a result of this National Academy of Sciences report that the President have a Cabinet committee to try to pull the pieces together, set priorities within the goal and mobilize the FDA, the EPA, and the USDA in some direction to get a handle on it along the lines you suggest; is that the sensible way to go about this?

Mr. ROSENFELD. I don't want to make too much of a big deal over the NAS report. That is only the latest piece of evidence. Prior to the NAS report coming out in May, Public Voice and the World Wildlife Fund held a joint press conference where we released our study on agrichemical use in America; and we called on the administration to make the kind of commitment that it has made and also to convene a blue ribbon commission that would look at the kinds of issues we need to address so that we can, region by region, cropping system by cropping system, set up some measurable goals.

Mr. Aguirre's point about the need to tackle these issues, not necessarily in a global sense, but on a local and regional basis so that we don't have solutions that may work in one place but not in another is a good suggestion; but we have long way to go before we are even close to that, and years of Federal neglect have hurt us in our ability to carry that through in an expeditious way.

Mr. HORN. Do the other witnesses want to comment?

Mr. AGUIRRE. I would suggest that the agricultural system is extremely complex and very localized in nature. If you want to address specific goals, be it food safety, environmental goals or what have you, you need to avoid broad national mandates and create a spectrum of alternative production systems that the farmer can utilize to address those problems.

There is ample authority in law or research on sustainable agriculture, organic farm production systems, integrated pest management. I think the question is providing the funding for it.

Mr. GARDNER. I would like to combine your question with the chairman's previous question about public health.

Many scientists say that pesticide residues are rather low on the risk list of things that the public is confronted with. In fact, there was a story in the Washington Post today about another independent scientific report that commented on the priorities of the public health risk; carcinogens, pesticides again were at the bottom of this list. Sunlight was close to the top.

So that is not to say that we ought to be complacent about the system that is in place or the practices that we have been following, but it is also no reason to take extreme measures. Things like integrated pest management applied carefully and repairing our

regulatory system are all the kinds of institutional changes that can and ought to be made, not with any sense of panic, but in a thoughtful, deliberative manner.

Mr. HORN. Sounds like you are mostly in agreement here about how we go about this. Am I wrong?

Mr. ROSENFELD. I think our analyses of the public health risks are pretty different at this point. We also feel that although we don't need necessarily a national mandate, if we don't set up a national strategy with measurable goals applied on a local and regional level to take into consideration these geographical differences, we are never going to get anywhere, because the sense of commitment, the sense of direction is not going to be there.

It becomes a self-fulfilling prophecy when you say that farmers don't have the wherewithal to make these kinds of changes. It has been years of Federal neglect that has led us down that road, and it is predictable that we don't have the tools to put in the hands of farmers right now.

Mr. TOWNS. The gentleman's time has expired.

Mr. Sanders.

Mr. SANDERS. Before I ask my question I would like to comment briefly on something Mr. Gardner said. Mr. Gardner made the point—and I didn't see the article—that a piece in the paper today indicated that pesticides may be less of a problem than sunlight.

Unfortunately, as we go about destroying the ozone layer sunlight no longer is a positive part of our life. It is like saying it could be less dangerous than drinking water. Unfortunately, as the groundwater in many communities of this country is becoming polluted, we can't drink the water. So I don't know if that is necessarily a good analogy, given what we are doing to the environment from the stratosphere to the groundwater.

Mr. Chairman, I come from an agricultural State, and sometimes when we look at the problem—we are today, I think, focusing on what happens to consumer and the positive causes of disease and cancer from eating certain products containing pesticides. There is another side to the story, and that is, there are people working in the field with those pesticides. The National Cancer Institutes write in their 1994 budget estimate that farmers from developed countries, including the United States, have elevated risks of soft tissue sarcoma, melanoma of the skin, and cancers of the brain, stomach, prostate, lip, and lymphatic systems.

There is right now a major study being undertaken which attempts to explain why farmers appear to have a higher rate of cancer than other workers and some of the evidence points to pesticides. We know the National Organization of Farm Workers was very concerned about the impact of pesticides on the health of their workers. I wonder if our guests might want to comment on that issue.

Mr. ROSENFELD. I think it stands to reason that we are not just looking at a consumer issue here. The survey results indicated that the concern is just as high with regard to environmental consequences. In results that we did not release, which we conducted for our internal benefit, we found that when we asked the public what they were most concerned about from effects of pesticide residues, it was pretty evenly split between food safety consequences,

the environmental consequences and the consequences for farmers and the communities surrounding them.

So I think this is an issue that we need to keep our finger on. And clearly farmers not only have a economic incentive to reduce the use of pesticides, but family farmers who have family members working, if they can reduce their own exposure to sprays, that is a benefit; just as if they can reduce the levels of residues in groundwater that they are drinking——

Mr. SANDERS. Are you familiar with work indicating farmers have a higher rate——

Mr. ROSENFELD. Yes. I have seen studies particularly in the Midwest and Kansas. I am not a medical doctor or an epidemiologist, so I wouldn't characterize myself as an authoritative expert on that.

Mr. GARDNER. When I made my comment about public health risk, I should have excluded agricultural workers from that because I think they are in a special category and deserve more care and attention. They are, after all, exposed to pesticides at rather high levels and at considerably more frequency than the average consumer of food.

Mr. SANDERS. Does it get you a little bit nervous that if the people who are producing our products are becoming more ill than we would like, what that might mean for the consumers?

Mr. GARDNER. That is a question of dose and exposure, and earlier in the opening remarks I think the point was made that we have to look at the level of risk that exists. Clearly the level of risk for agricultural workers is higher than that of consumers who consume food. When 70 percent of the foods contain nondetectable residues, the balance of foods have residues all within scientifically established tolerances. I think that that is a careful scientific look at the level of risk.

Mr. SANDERS. Would you not be in agreement with the fact that many of the pesticides being used have not been thoroughly analyzed in terms of their long-term impact on consumers?

Mr. GARDNER. There are a number of pesticides that have not received the kind of scientific workup that we would do today with a new pesticide coming on the market.

Mr. SANDERS. Which may mean that in terms of children, we really don't know the impact of what they are consuming?

Mr. GARDNER. That is what the NAS report said, and that is why it recommended that we get more data and that we improve our evaluation methods.

Mr. TOWNS. Congressman Synar.

Mr. SYNAR. Mr. Gardner, I assume GMA supports the food processors' petition to EPA with respect to the Delaney amendment, correct?

Mr. GARDNER. Yes. We have submitted comments to that effect.

Mr. SYNAR. From 1958 to 1992, both GMA and the NFPA lived with the interpretations of Federal agencies with respect to causes of cancer, concentrations defined, et cetera; is that correct? Between 1958 and 1992, you lived within the definitions set by those Federal agencies?

Mr. GARDNER. Yes.

Mr. SYNAR. So after the court decision came down, I guess the natural question is, Why change positions? You had been living with the Delaney amendment but, for the first time, it was going to be enforced, so do you suddenly find that the whole process is unconstitutional, unwise, immoral and the worst thing since Communism?

Mr. GARDNER. We have been living with the Delaney amendment because the agencies that have implemented it have tried to do so with common sense.

We find now that the results of the court decision would force EPA and FDA into a rather rigid, inflexible and impractical way of applying Delaney. We don't think that that bodes well for the future.

Mr. SYNAR. But the issue is not enforcement; it is whether legislation is necessary to do de minimis standards.

Mr. GARDNER. We don't agree that legislation is necessary. We think there are administrative ways that EPA could apply the existing law.

Mr. SYNAR. How long did you work for FDA before GMA.

Mr. GARDNER. Nine years.

Mr. SYNAR. Were you there when the Delaney clause was implemented?

Mr. GARDNER. I was there after the law was passed and during its period of implementation, and I was there when we had to work out the implementation of a Delaney provision that applied to animal drugs. It was that particular experience that led me to believe that the Delaney clause is not a practicable and reasonable way of applying the law.

Mr. SYNAR. But you lived under what Federal agencies set from 1958 to 1992?

Mr. GARDNER. Again, we lived under it because every day we were trying to find ways of working within the system, within the administrative flexibility and discretion that the agency had, to make rational decisions in applying it.

Mr. SYNAR. The GMA members extensively test their food in the processing plants, do they not?

Mr. GARDNER. That is correct.

Mr. SYNAR. Is that testing information readily available to EPA during their risk assessment of pesticides?

Mr. GARDNER. If they wish it.

Mr. SYNAR. Do they have to ask for it?

Mr. GARDNER. They have to ask for it. It is not automatically given to them.

Mr. SYNAR. Do you have suggestions on how we could get it to them faster? The reason I am asking is, will EPA every finish the re-registration if we don't change the law?

Mr. GARDNER. Experience has shown the way the re-registration process takes place is extremely lengthy. I don't dispute the futures you cited. I think it is going to be problematic.

As far as providing EPA with manufacturers' test data, I think that is something that ought to be looked into.

Mr. SYNAR. Mr. Aguirre, last July a witness from the Del Monte Company spoke about the tougher standards that are in place for

their growers. Is Del Monte unique among food companies, or do they have a common practice of having tougher standards?

Mr. AGUIRRE. I think Del Monte is unique in the sense that they certainly manufacture a specific product line, their commodities are sourced from unique areas of the country.

Mr. SYNAR. I am talking about the standards, not the products.

Mr. AGUIRRE. I could not specifically compare Del Monte with other companies.

Mr. SYNAR. How concentrated is this industry? How many companies make up this industry?

Mr. AGUIRRE. We have between 500 and 450 food processor members.

Mr. SYNAR. How about the top 10; how much do they make up of the total market?

Mr. AGUIRRE. I don't know. I don't know how you want to categorize the products.

Mr. SYNAR. Is it safe to say that most major food companies have tougher standards, such as recordkeeping and restrictions on certain pesticides?

Mr. AGUIRRE. It is certainly the case that companies are very interested in protecting their brands, and one facet of that includes managing pesticide residues.

Mr. SYNAR. Why won't the companies then support them being a mandatory part of legislation, if they have tougher standards than even we have in the Federal Government?

Mr. AGUIRRE. Management of pesticide residues requires flexibility according to specific conditions, where the product is grown and under what conditions.

Let me respond to a question about the NFPA petition. In no way is that petition intended to obviate the need for legislation. However, the petition addresses an important point. In light of *Les* v. *Reilly,* it is apparent that EPA has unnecessarily, in our judgment, brought pesticide residues into conflict with the Delaney clause; and that is why we are faced with the prospective loss of 32 pesticide chemicals.

Mr. SYNAR. Mr. Rosenfeld, are the USDA programs of help to our farmers in trying to work their way through the food supply and providing lower pesticide use?

Mr. ROSENFELD. Our analysis indicates that the programs, thus far, have been uncoordinated. They are piecemeal efforts; the tail doesn't know what the head of the dog is doing in most cases, and they are grossly underfunded, in large part because previous administrations have not supported them.

To give lip service to programs that are currently at USDA, I think, doesn't do us a service in terms of figuring out where we need to go. That is why we are talking about an integrated national strategy that will pull the agency efforts together.

Mr. TOWNS. The gentleman's time has expired. Congressman Mica.

Mr. MICA. Thank you, Mr. Chairman. We talked pretty much about domestic activity, food products that are produced in the United States. I am a little bit concerned about the foreign imports. I guess in the winter, in the north—in Florida, you go into the supermarket and you see most of the products are coming from Cen-

tral America, South America, France, wherever. What kind of protection——

Mr. SCHIFF. Would the gentleman yield? Before Congressman Synar leaves—I apologize for being late; I had a markup in judiciary, and I want to apologize to the witnesses and welcome our colleague here. Your questions are always insightful, and I hope you will visit us again.

I yield back. I thank the gentleman for yielding.

Mr. MICA. It was good to see Congressman Synar here. He always asks tough questions.

We have become so preoccupied with our domestic production that we seem to be tying our producers and folks into little bitty knots. Do you know what percentage of products are coming in, like fresh fruits and vegetables, and you see more and more imported canned and processed goods on the shelves that are coming in internationally; and with NAFTA and other agreements, it looks like we will have even more.

What kinds of protections do we now have and what percentages of these products are coming in; and do you see an increase, and is there a problem? We don't monitor the fields of Mexico or Guatemala or Costa Rica or the canned tomatoes from Italy. What is the situation?

Mr. AGUIRRE. There are several ways that we attempt to provide assurances that pesticides are used in an appropriate fashion and residues are limited to comply with Federal standards. Of course, the most obvious is FDA monitoring programs for products coming into the borders. Those monitoring efforts are very significant, and it is certainly a policy question as to whether those monitoring programs should be increased, decreased or remain the same. But in the data collected there is no indication that there is a food safety problem associated with pesticide use.

Also, many companies that rely upon the importation of commodities, Chiquita Brands, Dole, Del Monte, et cetera, will send pest management supervisors overseas and arrange specific agreements for the use of pesticides on the commodities to be exported.

Mr. MICA. So there is some monitoring of that now, but certainly not adequate. The other question is, Is there an increase in imported processed food products or fresh fruit and vegetables?

Mr. AGUIRRE. I couldn't tell you specifically if there has been an increase.

Mr. MICA. Do we know what percentage of the market it is?

Mr. AGUIRRE. The diversity of the American diet has certainly created a demand for many products which are grown overseas.

Mr. ROSENFELD. In certain times in the winter the fresh fruit and vegetable market is virtually 50 percent from imported products.

Mr. MICA. Wouldn't it be almost impossible to monitor those products in the various countries, and even the spectrum of countries will increase dramatically with the reduction in trade barriers, particularly agriculture; is that not the case?

Mr. ROSENFELD. There is no effective system of monitoring what they are doing in the fields. I can attest to that, given my experience in Guatemala in the late 1980's. There programs were very underdeveloped.

There is a series of Government reports on monitoring of imported foods, and the message is that the monitoring effort is inadequate. It would stand to reason, given the relatively few points of entry for those products in comparison to all the distribution points of domestic products, it should be easier to monitor at the points of entry the imported foods than it is the domestic foods. We have had problems monitoring both.

Mr. MICA. The other thing is—it might sound a little gross, but wet is an acceptable standard and I guess the Delaney amendment gives a lot of inflexibility. People don't realize it, but they are ingesting all kinds of foreign materials almost constantly; and where do you get—that is the purpose of this hearing, what becomes cost-effective and protects the public safety. Where do you see us striking that balance?

Mr. ROSENFELD. Let me say this about the Delaney clause. I think there is a misimpression that the Delaney clause is a zero-risk kind of a standard. Under the Delaney clause for pesticides and processed foods, you can have up to the level of the raw commodity tolerance of pesticides in that processed food even if they are carcinogens. So Delaney doesn't say, as applied to pesticide residues, you can't have a residue of a carcinogen in the product.

It has always been the approach of most consumers organizations that have worked on this issue that risk assessment methods are inherently uncertain. They are sophisticated now, but they are not scientifically precise and they tend to be very subjective in their application from a practical persepective. So the philosophy behind the Delaney clause, that it is better to protect the consumer when you have that kind of uncertainty than take the risk of making an error that is going to hurt us was down the road, is one that still should underlie the approach that we have.

There may be other reasons to look to improve on what the Delaney clause has done, but I think it has gotten essentially a bad rap.

Mr. MICA. Mr. Gardner, you represent the Grocery Manufacturers?

Mr. GARDNER. That is correct.

Mr. MICA. What do you see as the cost benefit to all this? What do you recommend from the Grocery Manufacturers' standpoint as far as how we should address this?

Mr. GARDNER. The Delaney clause?

Mr. MICA. Yes.

Mr. GARDNER. Our support is for the Lehman-Bliley-Rowland bill which, with respect to Delaney and its application to pesticides, is the way to go. It produces a neglibile risk standard and attempts to build in certainly procedural changes that would improve EPA's processing of the pesticide reviews and is a more balanced approach than the one we have today.

Mr. AGUIRRE. I want to point out that the Delaney clause is extremely inflexible when a food additive regulation is required for pesticide residues in processed foods. The National Academy of Sciences in a report found that the Delaney clause is counterproductive. So we support H.R. 1627. I believe Delaney clause reform is the most important aspect of reforming pesticide regulation today that Congress must address.

Mr. TOWNS. Thank you.

I yield to the ranking member of the subcommittee a very conscientious and hardworking individual, for his opening statement or any comments he might have, or questions, at this time.

Mr. SCHIFF. Mr. Chairman, first I want to gain apologize to the witnesses for my delay. I was in another committee. I thank Congressman Horn and Congressman Mica for being here, making sure we carried on on our side.

Thank you for holding this hearing. I think it is on a subject which is getting more and more publicity. I have to add that—you stated it, but I want to affirm my desire that this hearing, valuable as it is, be followed up in the near future with a hearing with the Government witnesses, so we can hear exactly what the Government agency conclusion is as to what is necessary here, if anything, since we don't know what they think and how they intended to approach this situation.

So I thank you for holding the hearing and yield back.

Mr. TOWNS. Thank you. I want to thank all the witnesses for your testimony. Thank you very, very much.

I would now like to call our second panel of witnesses who will testify on the feasibility of marketing food products with low pesticide residues in the conventional market and in the city. The panel will consist of Dr. Nicholas Hether, manager of biochemical research, food purity and regulatory sciences, Gerber Products Co.; Mr. Bernard Landes, director of marketing, Health Valley Foods; Mr. Mark Winne, executive director of the Hartford Food System; and Dr. J.B. Pratt, owner of Pratt's Supermarket.

Dr. Hether, please begin. You sort of know the rules that your entire statement will be included in the record. We would like you to summarize within 5 minutes and when the red light comes on, that means your 5 minutes are up.

STATEMENT OF NICHOLAS W. HETHER, GERBER PRODUCTS CO.

Mr. HETHER. Chairman Towns and members of the subcommittee, thank you for inviting me to testify today on behalf of the Gerber Products Co. My name is Nicholas Hether and I am the manager of biochemical research, food purity and regulatory sciences at Gerber.

I appreciate the opportunity to share with you Gerber's efforts to ensure our baby foods are safe and pure. If I could leave you with three thoughts today, they would be the following:

First, it is possible to produce a world class competitive product without an excessive reliance on pesticides.

Second, methods to eliminate the risk of pesticides in processed foods are known and many food companies are using them.

Third, the economic cost for any one company to implement a pesticide safety system is small since the changes required go hand in hand with a commitment to a high level of food quality.

Since 1928, generations of parents have relied on Gerber's commitment to quality. Long ago, we realized that babies have needs that are qualitatively different from those of adults. At Gerber, quality means manufacturing a product that is absolutely safe, nutritious, wholesome, and a good economic value.

To this end, we developed a total system approach to quality. Our goal is no detectable pesticide residues in our baby food. Gerber's pesticide program is not limited to a specific farming technique, or a testing policy. Our program begins with the farmer's soil and follows our product every step of the way to the baby's dish.

Gerber's pesticide safety program dates back to the 1940's when we first started pesticide monitoring. Since that time, our approach to eliminating pesticide residues expanded to include the following elements: soil testing, seed development, integrated pest management techniques and special processing requirements.

Additionally, our company is a driving force in the search for improved technologies, scientific methods and agricultural procedures. Continual focus on the special needs of infants and children leads to constant evaluation and improvement of our pesticide program.

I would like to highlight a few of the essential points of our program for you.

Our soil testing program is used for certain crops that are particularly vulnerable to persistent pesticide residues in the soil. We have a soil testing program for these crops, and before the ground is plowed, or the first seed is planted for Gerber use the field is tested and certified free of persistent pesticide residues, to ensure the safety of the crop. If a field fails to meet Gerber's standards, we don't buy the produce from it.

Seeds for Gerber crops are carefully selected and handled. Gerber is constantly researching and developing new varieties of fruit and vegetable seeds that are adaptable to local climates and more resistant to disease to help avoid unnecessary pesticide use.

Gerber encourages our growers to practice integrated pest management techniques, which achieve healthy crop growth through alternative agricultural methods—which are continually evaluated in our research program—rather than relying solely on pesticides.

Use of high-pressure washing and peeling, and thermo-processing techniques are final steps in removing pesticides and eliminating residues in our products.

We base our approach on the principles of hazard analysis and critical control points. HACCP is the analytical framework through which we examine the key stages of the entire food process. The HACCP process examines every step from soil to jar to find opportunities to eliminate pesticides residues. Gerber developed specific HACCP programs for pesticide elimination—setting the standard for baby food.

Continuous testing of raw and processed products is an integral part of our system. Our comprehensive program anticipates and prevents residues from occurring in our baby food.

Given our comprehensive system, we tailor program techniques to address crop differences.

Carrots are a good example of how we involve several steps to eliminate pesticides residues.

We test the soil before carrot crops are planted.

We rotate carrot crops with other crops to reduce disease and pest pressures.

We plant disease-resistant varieties of carrots developed in our research program.

We utilize the HACCP process to identify stages at which we can eliminate pesticide residues.

We use specific processing techniques such as crowning and peeling to remove the portions of the carrot where pesticide residue may remain.

Our experience resulted in new methods to reduce reliance on pesticide use, but our research is ongoing and broad in scope. We continue to seek new, alternative pest control techniques.

For example, we are working with researchers to develop orchard ground covers that, when planted distract pests from fruit trees. This can eliminate the need for some pesticide application.

Gerber also is working with researchers on insect mating disruption projects such as these gadgets here, a very simple technology to reduce insect populations and eliminate the need for certain pesticides. Gerber growers are currently testing this technique by placing insect attractants on the branches of their peach trees.

Gerber's success is grounded partly in our strong, working partnerships with our growers, some of whom have been supplying crops to Gerber for decades. If pesticides are needed, Gerber growers use pest scouting—including examination of the crop to determine infestation—and monitoring programs to help determine the appropriate timing for applications. Scouting pays off in lower residues because pesticides are used sparingly and only when they will be most effective.

In addition, Gerber works closely with the U.S. Department of Agriculture's Extension Service and various university agriculture departments in a variety of ways—collecting and disseminating information and participating in formal and informal studies—to help to bring together research knowledge and experience in the fields to ensure better products.

The systems I described today are well known, effective, and already in use across the country. In this regard, we understand that we are not unique, but we are special. Gerber maintains a cost-effective, comprehensive system so that we can continue to produce baby foods that are safe and pure. However, no analysis of this issue is complete without a thorough examination of many pesticide safety programs being made throughout the food industry. We urge you to look to other industry leaders in completing this perspective.

Thank you and I would be happy to respond to questions.

Mr. TOWNS. Thank you.

[The prepared statement of Mr. Hether follows:]

Chairman Towns and Members of the Subcommittee, thank you for inviting me to testify today on behalf of Gerber Products Company. My name is Dr. Nicholas Hether and I am Manager of Biochemical Research, Food Purity and Regulatory Sciences at Gerber. I appreciate the opportunity to share with you Gerber's efforts to ensure that our baby foods are safe and pure.

If I could leave you with three thoughts today, they would be the following:

- it is possible to produce a world class, competitively priced baby food product without an excessive reliance on pesticides,
- methods to eliminate the risk of pesticides in processed foods are known, and many food companies are using them, and
- the economic cost for any one company to implement a pesticide safety system is small, since the changes required go hand in hand with a commitment to a high level of food quality.

Since 1928, generations of parents have relied on Gerber's commitment to quality. Long ago, we realized that babies have needs that are qualitatively different from those of adults. At Gerber, quality means manufacturing a product that is absolutely safe, nutritious, wholesome, and a good economic value. To this end, we developed a total systems approach to quality. Our goal is no detectible pesticide residues in our baby food. Gerber's pesticide program is not limited to a specific farming technique, or a testing policy. Our program begins with the farmer's soil and follows our product every step of the way to the baby's dish.

Gerber's pesticide safety program itself dates back to the 1940s when we first started pesticide monitoring. Since that time, our approach to eliminating pesticide residues expanded to include the following elements: soil testing, seed development, integrated pest management techniques and special processing requirements. Additionally, our company is a driving force in the search for improved technologies, scientific methods, and agricultural procedures. Continual focus on the special needs of infants and children leads to constant evaluation and improvement of our pesticide program.

I would like to highlight a few of the essential points of our program for you.

- **Soil Testing** -- Certain vegetable crops, like squash, are vulnerable to persistent pesticide residues in the soil. We have a soil testing program for these crops, and before the ground is plowed, or the first seed is planted, fields are tested for

pesticide residues, to ensure the safety of the crop. If a field fails to meet Gerber standards, we don't buy the produce from it.

- **Seed Development** -- Seeds for Gerber crops are also carefully selected and handled. Gerber is constantly researching and developing new varieties of fruit and vegetable seeds that are adaptable to local climates and more resistant to disease to help avoid unnecessary pesticide use.

- **IPM** -- Gerber encourages our growers to practice Integrated Pest Management (IPM) techniques, which, as you know, achieve healthy crop growth through alternative agricultural methods -- which are continually evaluated in our research program -- rather than relying solely on pesticides. If pesticides are needed, the timing between the last application and harvest, or the "pre-harvest interval," is adjusted to prevent residues in the finished product.

- **Special Processing Requirements** -- Use of high-pressure washing and peeling, and thermo-processing techniques are final steps in removing pesticides and eliminating residues in our products.

We base our approach on the principles of Hazard Analysis and Critical Control Points (HACCP). HACCP is the analytical framework through which we examine the key stages of the entire food process. The HACCP process examines every step from soil to jar to find opportunities to eliminate pesticide residues. Gerber developed specific HACCP programs for pesticide elimination -- setting the standard for baby food.

Continuous testing of raw and processed products is an integral part of our system. Our comprehensive program anticipates and prevents residues from occurring in our baby food.

Let me give you a few examples of how we apply these different measures to actual crops. As you may be aware, vulnerability to pesticide residues varies from crop to crop. Given our comprehensive system, we tailor program techniques to address crop differences. For example, soil testing is critical for some vegetables, like squash and carrots, that may absorb pesticide residues. Therefore, these crops cannot be planted for Gerber's use until the field is tested and certified free of persistent pesticide residues. Crop rotation reduces the need for pesticide use in crops like beans, peas and carrots. We,

therefore, encourage our growers to rotate crops when planting these vegetables.

Seed research was useful in developing new peach varieties like the "All Gold" and "Goldilocks" varieties, which the University of Arkansas developed for Gerber. These varieties increased resistance to bacterial leaf spot and require fewer fungicide sprays. Other improved varieties include carrots, spinach, squash, green beans, and apples.

We also take advantage of climatic conditions in various parts of the country to reduce the need for pesticides. For example, the Michigan green bean crop is planted for harvesting in August. The timing is critical because it fits between the first and second generation of the European Corn Borer, an insect that damages beans. Pesticide applications are not needed when the harvest is planned for this "window." We use another effective technique in regions with multiple growing seasons, like Arkansas, where we uses the Spring spinach crop for baby foods because fewer pesticides are needed. Gerber peas are all grown in Michigan, where cool climates help eliminate the need for pesticide application to the crops.

Carrots are a good example of how we involve several steps to eliminate pesticide residues. We:

- o test the soil before crops are planted;
- o rotate carrot crops with other crops to reduce disease and pest pressures;
- o plant disease resistant varieties developed in our research;
- o utilize the HACCP process to identify stages at which we can eliminate pesticide residues;
- o use specific processing techniques such as crowning and peeling to remove the portions of the carrot where pesticide residue may remain.

Our experience resulted in new methods to reduce reliance on pesticide use, but our research is ongoing and broad in scope. We continue to seek new, alternative pest control techniques. For example, we are working with researchers to develop orchard ground covers that, when planted, distract pests from the fruit trees. This can eliminate the need for some pesticide application. Gerber also is working with researchers on insect mating disruption projects to reduce insect populations and eliminate the need for

certain pesticides. Gerber growers are currently testing this technique by placing insect attractants on the branches of their peach trees. These attractants draw the males of certain insect populations, and distract them from mating. This reduces the insect population and the need for pesticide application.

Gerber's success is grounded partly in our strong, working partnerships with our growers, some of whom have been supplying crops to Gerber for decades. If pesticides are needed, Gerber growers use pest scouting -- examination of the crop to determine actual pest infestation -- and monitoring programs to help determine the appropriate timing for application. Scouting pays off in lower residues because pesticides are used sparingly and only when they will be most effective.

In addition, Gerber works closely with the U.S. Department of Agriculture's Extension Service and various university agriculture departments in a variety of ways -- collecting and disseminating information and participating in formal and informal studies -- to help bring together research knowledge and experience in the fields to ensure a better product.

The systems that I described to you today are well-known, effective, and already in use across the country. In this regard, we understand that we are not unique, but we are special. Gerber maintains a cost-effective, comprehensive system so that we can continue to produce baby foods that are safe and pure. However, no analysis of this issue is complete without a thorough examination of the many pesticide safety efforts being made throughout the food industry. We urge you to look to other industry leaders in completing this perspective.

Thank you. I would be happy to respond to any questions you may have.

Mr. TOWNS. Before I call on Mr. Landes, pull the microphone closer to you.

STATEMENT OF BERNARD LANDES, DIRECTOR OF MARKETING, HEALTH VALLEY FOODS

Mr. LANDES. Good morning, Mr. Chairman, members of the subcommittee. My name is Bernard Landes. I am director of marketing for Health Valley Natural Foods of Irwindale, CA. I am responsible for all marketing activities and for regulatory and nutritional affairs. I work closely with the FDA on issues pertaining to the NLEA and have worked with the U.S. Senate staff on the Organic Foods Production Act of 1990. I am also a member of the board of directors of the National Nutritional Foods Association.

I am accompanied this morning also by our food and drug counsel, Mr. Scott Bass of Piper & Marbury.

Health Valley is a privately held corporation that has been in business since 1970 and is today the largest company in America producing only natural products. Annual sales are in excess of $150 million. We are also, to the best of our knowledge, the largest consumer of organic food ingredients in the world. In 1992, Health Valley used over 50 million pounds of third-party certified organic grains, fruits, fruit juices, legumes, and vegetables. In 1993, Health Valley will use over 75 million pounds of certified organic ingredients.

Health Valley manufactures over 250 different varieties of natural foods of which 95 percent contain organic ingredients. These products, which include cereal, bakery products, crackers, canned soup, chili, and snack products, are made with from 30 percent to 100 percent organic ingredients. We offer 32 products that are between 95 and 100 percent organic, thereby qualifying to be sold with the descriptor "organic" on the label. Products that contain 50- to 95-percent organic ingredients contain an indication on the front panel identifying ingredients that are organic, and products with less than 50 percent include those organic ingredients present on the ingredient panel only.

Sales of our products containing organic ingredients represent over 95 percent of all of our sales. About 90 percent of Health Valley's organic products are sold through natural food stores, ranch markets, and natural food supermarkets, with the balance sold in mainstream grocery stores such as Kroger, Vons, Publix, and Food Lion.

Health Valley always uses organic ingredients when they are available in sufficient quantity, are of sufficient quality, and are not prohibitively priced. At this time, there are some grains, such as rice; fruits such as pineapple and papaya; some vegetables, such as mushrooms; and some herbs and spices, such as cinnamon that are not available in accordance with the above criteria. But even if it is not possible to make a product with 95 percent or more organic ingredients to qualify for use of the descriptor "organic," we are committed to providing our customers with the highest possible level of organic ingredients, thereby enhancing the perceived value of the product to the customer.

Health Valley pays a premium price for organic ingredients. This premium is generally from 15 to 20 percent compared to commer-

cial ingredients. These premiums, however, are not reflected in Health Valley's retail prices, which are comparable to other natural products made with commercial ingredients; and in some cases, Health Valley products are less expensive than mainstream products that are targeted principally at health-conscious consumers.

We do not use traditional advertising, but rather we disseminate information about the benefits of our products, including organic ingredients, to over 1 million customers on our internal mailing list and to over 11 million other health-conscious consumers.

Health Valley has also helped to expand the market for organic foods by supporting the Organic Farming Research Foundation, the Organic Foods Production Association of North America, the Committee for Sustainable Agriculture, and the California Certified Organic Farmers.

We also sponsor a variety of educational conferences on organic farming. Health Valley provides an incentive for farmers to convert their fields to organic production by paying a premium price for their crops during the 3-year transition period required prior to organic certification. We do this even though the ingredients cannot be certified or labeled as organic. Health Valley also supports organic farmers by providing a market for crops which they grow in rotation to strengthen the soil in their fields.

There are two principal obstacles that stand in the way of more rapid and widespread production and sale of organic products. First, there is a limit to the amount of organic ingredients that are available, and because there is a 3-year period of transition before commercial fields can become organic fields, organic production is slow in developing.

The second major obstacle is the absence of Federal standards for organic products. The Organic Food Production Act of 1990, part of the 1990 farm bill, mandated the establishment of national standards for organic foods. The act was designed to establish a national certification for growers and processors that would create a single standard to replace the 35 different State and private certification programs now in existence, many with conflicting standards.

Health Valley believes that the Organic Foods Production Act of 1990 will not provide its intended benefit for the Nation's health in the absence of the Federal Government taking a strong leadership role in eliminating these obstacles and providing adequate funding to ensure the law's full and prompt implementation.

Thank you.

[The prepared statement of Mr. Landes follows:]

Health Valley Foods
FOR HEALTHIER LIVING

TESTIMONY OF BERNARD M. LANDES

Director of Marketing - Health Valley Foods, Inc.

I am here representing Health Valley Natural Foods of Irwindale, California. Health Valley is a privately held corporation that has been in business since 1970 and is today the largest company in America producing only natural prepared foods. Annual sales are in excess of 150 million dollars. The company is also, to the best of our knowledge, the largest consumer of organic food ingredients in the world. In 1992 Health Valley used over 50 million pounds of third party certified organic grains, fruits, fruit juices, legumes and vegetables. In 1993 Health Valley will use over 75 million pounds of certified organic ingredients. These ingredients are all certified by recognized independent third party certifying organizations. Currently, in the absence of a blanket certification by U.S.D.A., Health Valley ingredients are certified by a total of 28 different certifying organizations.

Health Valley manufactures over 250 different varieties of natural foods, of which 95% contain organic ingredients. These products, which include cereal, bakery products, crackers, canned soup and chili and snack products, are made with from 30% to 100% organic ingredients. Health Valley offers 32 products that are between 95% and 100% organic, thus qualifying to be sold as "Organic." Those products which contain 50% to 95% organic ingredients have a burst on the principal display panel identifying the organic ingredients with which the product is made. Those products with less than 50% organic ingredients list the organic ingredients on the ingredient panel. Health Valley's long term goal is to have all products contain 95% or more organic ingredients.

Sales of products containing organic ingredients represent over 95% of all sales. About 90% of Health Valley's "Organic" products are sold through natural food stores, ranch markets and natural food supermarkets, with the balance sold in mainstream grocery stores such as Kroger, Vons, Publix, and Food Lion markets.

Health Valley is committed to making healthier foods that offer the greatest possible range of benefits to health conscious consumers, including foods that contain organic ingredients and are also fat-free, cholesterol-free, and made without refined sugar, white flour, excess salt, preservatives or artificial ingredients.

Health Valley always uses organic ingredients when they are available in sufficient quantity, are of sufficient quality, and are not prohibitively priced. At this time there are some grains

HEALTH VALLEY FOODS, INC · 16100 FOOTHILL BOULEVARD · IRWINDALE, CALIFORNIA 91706-7811
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such as rice, some fruits such as pineapple and papaya, some vegetables such as mushrooms, and some herbs and spices such as cinnamon that are not available in accordance with the above mentioned criteria. But even if it is not possible to make a product with 95% or more ingredients to qualify for use of the descriptor "Organic", Health Valley is committed to providing our customers with the highest possible level of organic ingredients, thereby enhancing the value of the product to the customer.

Health Valley pays a premium price for organic ingredients. This premium is generally from 15% to 20% compared to commercial ingredients. These premiums are not reflected in Health Valley's retail prices, which are comparable to other natural products made with commercial ingredients. Indeed, Health Valley products are often less expensive than similar mainstream products targeted at health conscious consumers.

Health Valley has helped to expand the market for organic products in many ways. For example, the company's "Save the Earth" Policy is clearly elucidated on packages, labels and in company literature, and stresses the environmental benefits of organic farming methods, specifically helping to maintain and restore vital topsoil and helping to reduce the contamination of our water supplies with agricultural chemicals. Health Valley does not represent our organic products to be free of pesticide residues, nor do we represent our organic products to be safer to eat or of higher nutritional value. We do, however, state our belief that organic foods taste better.

Health Valley does not do traditional advertising, but rather utilizes direct marketing programs to foster a personal relationship with over 1,000,000 customers on our mailing list. These customers receive regular product samples and newsletters, all of which provide detailed information about our products and their benefits, including the presence of organic ingredients. In addition to programs for the company's existing customers, Health Valley uses database marketing to reach other health conscious consumers and convey information about Health Valley and the many benefits of our products, including their organic ingredients. In 1992 Health Valley sent out more than 11 million product samples to such consumers and in 1993 the company will send out approximately 6 million samples. Health Valley has also published 4 cookbooks and healthier eating guides which also provide extensive information about the environmental benefits of organic foods. A total of nearly 1,000,000 copies of these books have been sold over the last ten years.

Health Valley has also helped to expand the market for organic foods by working closely with and supporting the efforts of organic farmers and organizations supporting organic farming including the Organic Farming Research Foundation, OFPANA, the Committee for Sustainable Agriculture, and California Certified Organic Farmers. And Health Valley also sponsors educational conferences including the Organic Farming Research Foundation Conference on Legal Aspects

of Organic Agriculture and Product Regulation being held in Oakland, California in October, 1993. Health Valley's commitment to developing the market for organic foods is further evidenced by the fact that the company has created a senior management position to deal exclusively with the management and further development of the company's growing organic program.

Health Valley provides an incentive for farmers to convert their fields to organic production by paying a premium price for their crops during the three year transition period required prior to organic certification. We do this, even though the ingredients cannot be certified or labeled as organic. Health Valley also supports organic farmers by providing a market for crops which they grow in rotation to strengthen the soil in their fields. For example, we now buy beans under contract from California farmers whose principal crop is tomatoes, but who grow beans as part of the crop rotation. Two other programs exemplify Health Valley's support for organic farmers. The company has contracted with and is helping a chili grower in New Mexico meet state standards for organic certification. The company has also convinced a major frozen vegetable processor in Wisconsin that a market exists for frozen organic vegetables and is helping to locate growers who will provide the crops for this program. Programs such as these help farmers to transfer increasing amounts of land to organic production without experiencing an economic penalty.

There are two principal obstacles that stand in the way of more rapid and widespread production and sale of organic products. First, there is a limit to the amount of organic ingredients that are available. And because there is a three year period of transition before commercial fields can become organic fields, new organic production is slow in developing. Many commercial farmers are reluctant to make the transition to organic because they lack the knowledge of how to make the conversion and they believe that the extra cost will not provide extra revenue.

The second major obstacle is the absence of Federal standards for organic products. The Organic Food Production Act of 1990, part of the 1990 Farm Bill, mandated the establishment of national standards for organic foods. The act was designed to establish a national certification program for growers and processors that would create a single standard to replace the 35 different state and private certification programs now in existence, many with conflicting standards or standards which could stifle the growth of organic farms and limit or eliminate entirely the use of the term "organic." This law is to go into effect on October 1, 1993, but as of this date the advisory board established by the act has not forwarded to the Secretary of Agriculture any recommendations for publication in the Federal Register. This advisory board is severely under funded and limited in their ability and willingness to give full and adequate consideration to all the issues that affect the ability of organic growers and processors to continue their organic programs. This delay in implementation is hurting the

entire organic industry by perpetuating uncertainty in the mind of the growers and processors regarding the standards to which they must adhere. And it is perpetuating uncertainty in the minds of consumers over exactly what constitutes organic products.

Health Valley is committed to continuing its work to make the world a better, healthier place, and its support of the production and use of organic foods as a principal means to reach this end.

Mr. TOWNS. Mr. Winne.

STATEMENT OF MARK WINNE, EXECUTIVE DIRECTOR, HARTFORD FOOD SUPPLY

Mr. WINNE. Chairman Towns, members of the subcommittee, my name is Mark Winne. I am the executive director of the Hartford Food System, a nonprofit organization in Hartford, CT, which develops food programs in low-income neighborhoods.

Hartford is the Nation's sixth poorest city. Almost 25 percent of our residents, including 44 percent of our children, live in poverty. In addition to poverty, our residents have limited access to quality affordable food. We only have two small chain store units currently in operation. And like other American cities, it is easier to buy fried chicken in Hartford than a head of broccoli, especially organic broccoli.

But starting in 1990, tens of thousands of pounds of organic, Connecticut-grown fruits and vegetables began finding their way into Hartford's low-income neighborhoods. Why was this important? The simple answer perhaps is that if it is good for all of us, then it is certainly good for everyone and should be available to everyone regardless of income, race, or residency. In fact, it may be more important for inner-city residents to have such choices available to them, given the greater levels of nutrition, health and environmental risk that they generally face.

Through several sets of low-income focus groups, we found a basic awareness of food safety risks, especially those related to pesticides. Though perhaps less sophisticated than the average consumer's opinion, low-income consumers reveal serious concern about the risk to themselves and their children from pesticide residues.

To address the issues of limited purchasing power, availability and information, the food system relies on a set of programs it calls Farm to Family. The centerpiece of Farm to Family is the Farmers' Market Nutrition Program, which provides coupons to participants of the WIC Program. These coupons can only be used to buy fresh produce at authorized farmers' markets.

Connecticut, fortunately, is one of only 11 States which receive Federal funds to operate the Farmers' Market Nutrition Program. This program helps farmers at the same time that it helps those who are nutritionally at risk. Over 60 percent of the WIC participants who are shopping at the farmers' markets with coupons are there for the very first time. Farmers are increasing their sales by 10 to 25 percent, and the number of markets are increasing dramatically, especially at inner-city locations. In the words of one Connecticut organic farmer who sells at a number of farmers' markets, the coupon program has made marketing in the inner city a viable alternative.

The food system has also promoted the use of food stamps at farmers' markets and farm stands to make it easier again to buy fresh produce. Our most direct approach to making low-pesticide produce available is through our community farm stand project. Farm stands are a cross between a farmers' market and a roadside stand but are located in low-income neighborhoods. Because of our commitment to increasing the awareness of inner-city households

to sustainable agriculture, the food system purchases over 60 percent of our farm stand produce from organic growers.

The stands are uniquely suited, as well, to provide information about sustainable agriculture. Through brochures and special farm tours, the food system has used the point of purchase as the point of education about pesticide issues.

What have the results been? When purchasing power is available, as through the coupons and food stamps, when low- and no-pesticide produce is also available through the markets and farm stands and when information is offered in an appropriate forum and setting, low-income shoppers will express a preference for sustainably produced fruits and vegetables over 80 percent of the time. This is based on our own test results.

What about price issues? Prices at food system farm stands are below those of conventional supermarkets even with a 60-percent organic produce mix. The wholesale price we pay to farmers is roughly for organic and conventional produce. Organic and reduced-pesticide produce sold in our State's farmers' markets is usually competitive in price with conventional produce sold in our supermarkets.

This is an organic tomato grown in Connecticut. I bought it yesterday in a predominantly Hispanic neighborhood in Hartford. It goes for the same price as a conventionally grown tomato in our farmers' market and also in neighboring supermarkets; and it made it from Hartford, CT, probably in better shape than I did.

Indeed, some of the results in other cities are more impressive than those in Hartford. We have seen programs similar to ours operating in Austin, TX, Boston, Philadelphia, and Washington, DC.

In closing, I would urge Government to use its large shoulders to nudge our market economy in the direction of sustainable agriculture. By utilizing directed purchasing power, such as the Farmers' Market Nutrition Program, by providing access in the way that many community organizations are now doing, and by offering culturally appropriate information to low-income consumers, we can reduce the social costs related to pollution and poor health, give all people—especially the poor—greater choice in the food they purchase and increase the supply of sustainably produced food.

Thank you, Mr. Chairman.

Mr. TOWNS. Thank you.

[The prepared statement of Mr. Winne follows:]

Chairman Towns, members of the Subcommittee, it is a privilege to be invited to appear before you today concerning the subject of sustainable agriculture and the American consumer. I will approach that subject by reviewing the affordability and availability in low income communities of produce grown with no or limited pesticides. For the most part, I will rely on my 15 years of experience in working with Connecticut farmers and Hartford's low income households. I will also draw on similar experiences from other cities.

To briefly set the stage, Hartford, Connecticut is the nation's sixth poorest city. Almost 25% of our residents including 44% of our children live in poverty. Our city's population is largely African-American and Hispanic. According to a 1990 study, 76% of Hartford's lower income families either experience hunger or are at risk of hunger. In addition to poverty, our residents have limited access to quality, affordable food. Since 1968, 11 chain supermarkets in Hartford closed their stores leaving only two small chain store units in operation.

Like other low income urban shoppers, Hartford's residents will use up to 40% of their annual income to buy food, compared to 10 to 15% for upper and middle income shoppers. They will face food prices that are up to 30% higher in city stores as well shelves that offer limited selections of quality food, especially produce. And like many other American cities, it is much easier to buy fried chicken in Hartford than a head of broccoli, especially organic broccoli.

But starting in 1990, tens of thousands of pounds of reduced chemical and chemical-free Connecticut-grown fruits and vegetables began finding their way into Hartford's low-income neighborhoods. Through the efforts of the Hartford Food System, products that had only graced the shelves of pricey establishments in the suburbs, were now available on the streets of a crowded Hispanic neighborhood, on the front steps of an African-American city church, and in the middle of Hartford's largest public housing project.

Why was it important to make organically-grown produce available to people who often had difficulty finding anything to eat? The simple answer might be that if low or no pesticide produce is as good for us as we claim, then it should be available to everyone regardless of income, race, or place of residency. In fact, it may be more important for inner-city residents to have such choices available to them given the greater levels of nutrition, health, and environmental risk that they generally face. But if you are poor and live in inner-city Hartford, you will face a number of barriers to the purchase of low pesticide food, most especially lack of money, education, and access.

Before we set out to make low pesticide produce available to low income households, we had to know what they thought about the issue. Through several sets of focus groups, we found a basic awareness of food safety risks, especially those related to pesticides. Though perhaps less sophisticated and often more exaggerated than the average consumer's opinion, low income consumers revealed serious concern about the risk to themselves and their children from pesticide residues. While concepts like organic and sustainable agriculture were not well understood, there was a strong association between freshness, quality, locally-grown, and cleanliness. And where people had agrarian roots, which was often the case with people from the Caribbean and the rural American South, there was an empathy for the purposes of sustainable agriculture. I would add that the concern that low pesticide produce might be more expensive was usually not raised, which may have been related to the fact that such produce was simply unavailable to them anyway.

To address the issues of cost, availability, and the lack of information about low pesticide foods, the Hartford Food System relies on a set of projects that it calls "Farm to Family".

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The center piece of Farm to Family is the Farmers Market Nutrition Program (FMNP) which provides coupons to participants of the Women, Infant, and Children (WIC) Program, low income seniors, and food pantry clients. These coupons can only be used to buy fresh produce at authorized farmers' markets. Connecticut is one of about 22 states which operates a Farmers' Market Nutrition Program, and fortunately, one of the 11 states which receives Federal funds to do so.

What's important about the FMNP is that it helps farmers at the same time that it helps those who are nutritionally at-risk. Over 60% of the WIC participants in the program for the first time have never been to a farmers' market before; 40% come back to the markets when their coupons are spent to buy produce with cash and food stamps; many participants significantly increase their consumption of fresh produce; farmers increase their sales by 10 to 25%; and the number of farmers' market increases dramatically, especially in inner-city locations. I am happy to report, Mr. Chairman, that I participated in the opening of a new farmers' markets in New York's South Bronx three weeks ago that was the result of the Healthy Start program and New York State's Farmers Market Nutrition Program. In the words of one Connecticut certified organic farmer who sells at a number of farmers' markets, "the Coupon Program has made marketing in the inner-city a viable alternative."

In addition to the Farmers Market Nutrition Program, the Food System has aggressively promoted the use of food stamps at farmers' markets and farmstands. Again, this makes it easier for low income shoppers to buy produce in general and low pesticide produce in particular. Through our efforts to facilitate the authorization of farmers' markets and farmstands as food stamp vendors as well to promote food stamp use by recipients at these locations, significant increases in both areas have been achieved.

Our strongest approach to making low pesticide produce available in low income neighborhoods is through our community farmstand project. Community farmstands are a cross between a farmers' market and roadside stand, but are located in low income neighborhoods where farmers' markets are often not viable. Like farmers' markets, these farmstands may be the only source in that area of affordable, fresh produce. Because of our commitment to increasing the awareness of inner-city households to sustainable agriculture, the Food System purchases over 60% of the Farmstand's produce from organic growers as well as from growers practicing integrated pest management.

The stands are uniquely suited to pass along information about sustainable agriculture. By using bilingual brochures that are written for low literacy readers, to running tours for inner-city families to organic farms, the Food System has used the point of purchase as the point of education and information about pesticide issues.

What has been the result of these efforts? When purchasing power is available as through coupons and food stamps; when low and no pesticide produce is available as through farmers' markets and farmstands; and when information is offered in the appropriate setting and form; low income shoppers will express a preference for sustainably-produced fruits and vegetables over 80% of the time -- a percentage based on a side-by-side preference test administered by the Food System to its farmstand shoppers.

What about the prices issues? Prices at HFS farmstands have consistently been below those of conventional supermarkets, even with a 60% organic produce mix. The wholesale price we pay to farmers is roughly the same for organic and conventional produce. Organic and reduced pesticide produce sold in our state's farmers' markets is usually competitive in price with conventional produce sold in the same markets.

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I know that organic produce is often priced higher, but I think there are several factors worth noting. One is that organic farmers, like any other good business people, will seek the higher price. When selling to more affluent and educated communities as well as to high-end restaurants, these farmers have found high demand which often means a high price for their products. On the other hand, organic growers tend to also have a well-developed social conscience. I see many organic growers keeping their prices down when selling in low income areas and to community service organizations. Another factor in pricing organic produce is the higher cost of production that is associated with a start-up or transitional organic enterprise. The initial cost for a young farmer of purchasing land, buildings, and equipment as well as lower yields during the early stages will translate into higher prices. But overall, my observation in Hartford as well as in other cities has been that established organic growers as well as farmers using reduced pesticide practices do not have significantly higher prices when selling to lower income or mixed income communities.

Indeed, some of the results in other cities are even more impressive than those in Hartford. Community supported efforts in Austin, TX, Boston, Philadelphia, and Washington, D.C. have resulted in a variety of activities which are making unprecedented quantities of local organically grown produce available to low income households in these cities. Coupled with education efforts, hands-on participation in the growing and distribution process, and democratic decision-making, low income residents are increasing their awareness of sustainable agriculture and its role in their food supply.

What are the common denominators among these efforts?

- The participation of grass-roots community organizations
- Support and participation of local organic and sustainable growers
- The availability of the Farmers' Market Nutrition Program
- An orientation toward local agriculture and the community food system
- Education and community awareness programs that are related to sustainable agriculture

POLICY RECOMMENDATIONS

1. Support the National Academy of Science recommendation to increase "information efforts (that) explain the relationship of appearance to food quality and safety (Alternative Agriculture)."

2. Conduct market research to determine consumer awareness, preference, price requirements, and shopping habits with respect to organic/low-input food. Such research should be demographically segmented to account for income, education, and racial/ethnic differences.

3. Support full funding of $8 million for the WIC/Farmers' Market Nutrition Program.

4. Direct USDA/FNS to remove all barriers to the food stamp authorization of farmers' markets and the use of food stamps at farmers' markets.

5. Support the efforts of state and local agencies and private non-profit organizations to create viable and accessible outlets in low income areas for organic/low input food.

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6. The Expanded Food and Nutrition Education Program should be directed and funded to provide information relative to food and pesticide issues to their low income clients.

In closing, I would urge government to use its large shoulders to nudge the market in the direction of sustainable agriculture. By utilizing directed purchasing power such as the Farmers' Market Nutrition Program provides; by improving access in the way that many community organizations are now doing; and by offering culturally-appropriate information to low income consumers, we can reduce the social costs related to pollution and poor health; give all people, especially the poor, greater choice in the food they purchase; and increase the supply of sustainably-produced food thus reducing its cost.

Mr. TOWNS. Dr. Pratt, owner of Pratt supermarkets.

STATMENT OF DR. J.B. PRATT, OWNER, PRATT FOOD STORES

Dr. PRATT. Good morning. I operate eight supermarkets in central Oklahoma; I am a health advocate as well. I was graduated from Baylor College of Medicine and finished an internship before returning to the family grocery business in 1973.

At Pratt's we have been working on nutrition issues since before 1987. In 1990, we started an environmental shopping program to stress product content and packaging in relation to the environmental impact of products. At this time, we introduced certified organic produce.

Nationally, certified organic foods represented $1.4 billion in sales in 1992. An annual growth rate of 10 percent is predicted for the next 5 years. The fastest growth is in processed foods with many new products available.

Education level is driving the markets more than is income level. Today's baby boomers are the best-educated adult people ever. As a result of our work on nutrition and the environmental shopping, I will share with you today a working supermarket that has as its hub sustainably produced—in this case, certified organically grown food.

This supermarket, which opened in 1964, in located in northwest Oklahoma City. It offers more choices to customers than regular stores. Customers in this store are mostly middle-income shoppers with a slightly-higher-than-average education and about an average income level.

It is a conventional supermarket in that it sells mainstream items, but it offers a lot more. It is based on my belief that we can reach more people than a health or natural food store with this new type of format, a crossover store, and be profitable as well. I call it Well Market.

I hasten to add that this is a profitable store with the following characteristics in addition to conventional products variety: certified organic produce, 12 to 15 percent of sales, a minimum of 50 items, and approximately 20 percent of produce space, weekly ads on the organic items, strong signage on organic products inside and outside the store, store tours and farms tours, weekly sampling of organic produce and organic processed foods, and quite a bit more.

Incidentally, there is good evidence that human health is related to the health of the soil. That is why in this store we stress how food is grown. We want customers to ask lots of questions about where food came from, who grew it what pesticides and fertilizers were used to grow it. This will be in addition to increasing questions on nutrition issues that customers already often ask.

The sustaintable—in our case, organic—food movement presents tremendous sales opportunities for small farmers, small manufacturers, and independent retailers. There is still a lot of education to be done for consumers, but retailers our size seem to do a really great job in this area. We relate to processors and growers from family operations.

I might add that organic produce varieties and appearance now are better than ever. My observation is that most chain stores are currently resisting offering a wide variety of certified organic

produce. I believe this is partly due to concern about how this would reflect on conventional produce. Sheer size of chain operations requires them to standardize their stores. This leaves them inflexible and less able to respond to differences such as educational level of various markets.

Organic simply will not sell equally well everywhere. Two things seem certain: certified organic produce should be given ample space in the produce department and priced no more than 10 to 15 percent higher than conventional produce overall. Close contact with our suppliers has resulted in excellent buys on certified organic produce which we advertise weekly.

Processed organically grown foods vary in price according to category. Cereal products, for instance, are cost priced competitively with national brands and are often lower in cost to the store and, therefore, to the consumer. We find that conventional food shoppers are responding to these items and to information we make available. We place the processed organic and other whole food items across the store, side by side with their counterparts, to increase visibility.

Customers are currently scrutinizing items for whole grains and lower fat, and this investigative attitude is ideal for identifying new certified organically grown products. Produce sales in this store are 20 percent higher as a percentage of sales than any of our other stores. Organic produce has increased total produce sales. I am also optimistic about further consumer awareness as the Organic Food Production Act goes into effect.

Additionally, the report by the National Academy of Sciences on Children and Pesticides has further increased consumer interest. The new food labeling law will also be helpful. As a retailer, I can satisfy consumer needs by offering certified organic food products.

I have a few slides to show you of this Well Market. As an introduction to the Well Market, here is a billboard where we encourage people to come to the store to purchase certified organic produce. This shows the Well Market sign just below our big Pratt sign in the store in northwest Oklahoma City.

Here is the first ad we ran showing organically grown food and lots and lots of consumer information.

Here is an example of organic produce displayed separate from the rest of the produce department, but we integrate items throughout the rest of the produce department as well.

Children are a big effort as far as our education push goes and we do several store tours monthly for children through the stores and through the produce department. We really believe in education, and since organic is a system, we have a poster showing how an organic farm operates. This is through the courtesy of the Committee For Sustainable Agriculture. We have blown this picture up and have a poster in each store.

We stress the positive benefits of organically grown foods, not the negative problems with conventional agriculture. There you see several of the reasons why we believe that certified organically grown foods have a place in supermarkets. This is point of sale material that we use. We are very intensive in our efforts to try these things out.

Here is a big display of certified organic apple juice with an explanation of the organic system at the top with a big sign showing organic grown foods. This is a very fast selling item in this conventional supermarket.

Here is the sampling program which is a critical area to get people to try and taste the products so they will see there is a great taste benefit as well as a benefit to the environment and potentially to personal health. You can see the intense signage that we put on the shelf to draw attention to these new products.

Finally, the name of the game is repetition. If people see me with my organic license plate they get one more message to think about buying organically grown foods.

Thank you very much.

[The prepared statement of Dr. Pratt follows:]

TESTIMONY TO THE HUMAN RESOURCES AND INTERGOVERNMENTAL RELATIONS SUBCOMMITTEE

J.B. PRATT, PRATT FOOD STORES

Greetings from Oklahoma, home of the 4,000-acre Kerr Center for Sustainable Agriculture. The center, formed in 1985, provides assistance to the agricultural community, seeking ecologically and economically sound methods of producing food and sustaining farm livelihood. Oklahoma passed its Organic Standards Law in 1990.

SUSTAINABLE AGRICULTURE AND THE CONVENTIONAL SUPERMARKET

I am an independent supermarket operator. I am also a health advocate. In that order, I think. And I don't like the way things are going, either way. I was graduated from Baylor College of Medicine and finished my internship at University of Texas-Parkland Memorial Hospital in 1973. I currently operate eight conventional stores in central Oklahoma which are under fierce competitive attack from other conventional stores and from a proliferation of newer alternative formats.

As a health advocate, I am disturbed by articles describing Americans' lifestyles as less healthy since the 1980's. Americans are getting fatter, and that includes children. Reports say that Americans are not wiling to accept responsibility for their own well-being. Poor diet and lack of exercise are the designated reasons.

Supermarket operator/Health advocate combination that I am, I see that most supermarkets are really doing very little to deliver the good mainstream information available about nutrition and health, including prevention of certain diseases through diet, as well as relationships of eating, environment and health. In fact, today's supermarket ads are mostly upside-down pyramids from the standpoint of the new symbol for healthy eating. It has been impossible to draw business to the conventional supermarkets without features including highly sugared soda pop, high-fat snacks, and often fatty meats like ground beef. I believe that things must change in food retailing. There

is too much information about the relationship of what we eat to prevention of chronic diseases and environmental degradation.

Lest you think good nutrition is not necessarily the domain of the supermarket, I refer you to the mandatory posting of information in the produce and meat departments by the FDA. In addition, the nation's largest food industry trade group, the Food Marketing Institute, states that..."As the purchasing agent for the consumer, food retailers are committed to providing customers with the opportunity and information to select foods that make up a nutritious diet."

At Pratts we have been working on nutrition issues since 1987. Additionally, in 1990 we started an environmental shopping program to stress product content and packaging in relation to the environmental impact--pollution and resource depletion. At this time we introduced certified organic produce.

Certified Organic Foods represented $1.4 billion in 1992 sales, and an annual growth rate of 10% is predicted for the next five years. The fastest growth is in processed foods, with many new products available.

Education level is driving the market more than is income level. Today's "baby boomers" are the best-educated adults ever.

As a result of our work on nutrition and the environmental shopping, I will share with you today a working supermarket that has as its hub sustainably produced (in this case, certified organically grown) food. This supermarket, which opened in 1964, is located in northwest Oklahoma City. It offers more choices to customers than regular stores. Customers in this store are mostly middle-income shoppers with a slightly higher than average education and income level. It is a conventional supermarket in that it sells mainstream items. But it offers much more. This is based on my belief that we can reach more people than a health or natural foods store with this new type of format--a "crossover store", if you will--and be profitable, as well. I call it Wellmarket.

I hasten to add <u>this is</u> a profitable store with the following characteristics in addition to conventional product variety:

- Certified organic produce (12-15% of sales)--minimum of 50 items; approximately 25% of produce space; weekly ads
- Strong signage on organic products inside and outside the store
- Whole foods
- Certified organic grocery products
- Recycling drop-off center
- Full line of vitamins, supplements, and herbs

-Bulk foods
-Free information on nutrition, health, and environment for adults and children
-Books and magazines on health
-Store tours and farm tours (local)
-Weekly sampling of organic produce and organic processed foods

I believe there is good evidence that human health is related to the health of the soil. That is why we stress how food is grown in this store. We want customers to ask questions about where food came from, who grew it, what pesticides and fertilizers were used to grow it. This will be in addition to increasing questions on nutrition issues that customers already often ask.

The sustainable (organic) food movement presents tremendous sales opportunities for small farmers, small manufacturers, and independent retailers. There is much education still involved for consumers, but retailers our size seem to do a great job in this area. We relate well to processors and growers from family operations.

My observation is that most chain stores are currently resisting offering a wide variety of certified organic produce. This is partly due, I believe, to concern about how this would reflect on conventional produce.

Sheer size of chain operations requires them to standardize their stores. This leaves them inflexible, and less able to respond to differences--such as in educational level--of various markets. Organics simply will not sell equally well everywhere.

Two things seem certain: organic produce should be given ample space in the produce department, and priced no more than 10%-15% higher that conventional produce overall.

Close contact with our suppliers has resulted in excellent buys on certified organic produce, which we advertise weekly.

Processed organically grown foods vary in price according to category. Cereal products, for instance, are cost-priced competitively with national brands and are often lower in cost to the store and therefore to the consumer.

We find that conventional food shoppers are responding to these items and to the information we make available. We place the organic and other whole food items across the store side by side with their counterparts to increase visibility. Customers are currently scrutinizing items for whole grains and lower fat, and this investigative attitude is

ideal for identifying new certified organically grown products.

Produce sales in this store are 20% higher as a percentage of store sales than any of our other stores. Organic produce has increased total produce sales. Organic produce is priced 10% to 15% higher than conventional produce.

I am optimistic about further consumer awareness as the National Organic Standards Act goes into effect. Additionally, the report by the National Academy of Sciences on children and pesticide has further increased consumer interest. The new food labeling law will also be helpful. As a retailer I can satisfy consumer needs by offering certified organic food products.

We do not sell organic foods by stressing the negative aspects of conventionally grown foods, but by the positive attributes of organics. We place affidavits near the certified organic produce. We stress organics in relating to sustainable agriculture because of the ease of explanation in comparison to such systems as IPM, as well as the certification system in place for organic farming.

Now you may wonder which is my priority--Grocer or Health Advocate. I believe this store proves we can be both-- be profitable businessmen and deliver healthy alternatives through information and wider choices to conventional grocery shoppers.

I would like to thank the Subcommittee on Human Resources and Intergovernmental Relations for supporting safer foods and inviting me here today.

Mr. TOWNS. Let me begin.

I notice, Doctor—that is a doctor of what?

Dr. PRATT. I was graduated from medical school in 1973, came back into the family business.

Mr. TOWNS. So you are an M.D.?

Dr. PRATT. Yes.

Mr. TOWNS. Let me begin, I guess, with you, Mr. Winne. In your view, what prevents you from bringing produce with lower pesticide residues into the inner city on a commercial scale? What stops you from being able to do it?

Mr. WINNE. One of the biggest barriers is education. We have lower educational levels in the inner city. That is our primary concern. There are relatively few efforts right now to provide education relative to sustainable agriculture, food safety in the food supply, to low-income families.

The EFNEP program, the Expanded Food Nutrition Education Program is underfunded and not able to anywhere come close to meeting the demand for its services in the area. It is virtually the only organization in existence that provides this kind of service.

Another obstacle is the availability of organic and low-pesticide produce. We are just getting more and more growers now participating in organic or reduced-pesticide programs, and the supply is increasing, but it is increasing slowly.

And a third obstacle is clearly purchasing power. Is there enough purchasing power in a low-income area where people will generally run out of food stamps by the third week of the month, where they will turn to food pantries to meet a certain portion of their food needs. So if you are having to choose, make some hard decisions, you may not be choosing organic.

In other words, supply has to increase, purchasing power has to increase, and educational programs directed at this issue need to increase as well.

Mr. TOWNS. This question would be directed to Mr. Landes and Dr. Hether.

Are your products more expensive than conventional foods, and if so, why?

Mr. LANDES. Let me comment on that because the traditional perception of natural foods is that they are more costly. However, the reason for that is more based on the distribution system which gets the product to the marketplace through specialty food distributors and through stores that attach higher profit margins than they would to traditional groceries. What we are seeing now is that as our products find their way into more traditional means of distribution, such as typical grocery stores with typical distribution, that our prices are comparable to, if not lower than traditional products on the shelf with similar types of ingredients that may or may not be organic.

Mr. HETHER. Gerber has distribution nationally across the country with 180 different products, all of which fall under our system. So we are really a conventional food supplier, and we are achieving our goals to provide a safe, pure food.

Mr. TOWNS. Dr. Pratt, I must admit that I am just fascinated by what you are doing there. I agree with the ranking committee member that—I wish Congressman Synar could have had an op-

portunity to see that because he comes from the great State of Oklahoma.

How much time is spent in terms of training and in terms of your own employees? As I talked to Mr. Winne with reference to the importance of the education process taking place, I think that you appear to have your employees involved in terms of training as well. How much time is sort of spent in that regard?

Dr. PRATT. The critical issue at first is to train the employees, to educate the employees on what the store is trying to do.

This store for 15 years was a conventional supermarket without any additional items, so you have employees who are thinking mainstream. A major effort on our part, though, is the services of a registered dietician who is also acutely aware of environmental and personal health costs of conventional agriculture. She spends several hours a week in the stores working with our employees, explaining to them what we are trying to accomplish. In addition, we ask them to read the literature that we make available to the customers.

But I would say the effort to educate employees is the critical maneuver in this, and this is what natural foods stores have done that makes them so effective.

Mr. TOWNS. Thank you very much. My time has expired.

Mr. Schiff.

Mr. SCHIFF. Mr. Chairman, because I missed a substantial portion of this hearing, I will yield to Congressman Horn, who has been here from the beginning.

I want to ask Dr. Hether, in the back of my mind I remember some, I guess I should say, unflattering publicity about the baby food industry. I seem to remember a question about price-fixing matters, a question about the contents of baby food. Am I ringing a bell with you?

Mr. HETHER. I think you are referring to the formula matters, and those are other companies. Those have occurred over the last year or so. Those are other companies and they are out of my expertise.

Mr. SCHIFF. I said in the industry. I deliberately did not specify a particular brand. I just wondered if those problems were resolved, if you knew; or if they are out of your expertise, I won't pursue them with you.

Mr. HETHER. I am not qualified to comment.

Mr. SCHIFF. In that case, I withdraw that line of questioning.

I want to thank, therefore, the panel for their testimony on this issue, Mr. Chairman, and I yield back.

Mr. TOWNS. Thank you.

Congressman Horn.

Mr. HORN. Just a brief question to Dr. Hether, and then two substantive questions.

I am fascinated by your title, which is manager of biochemical research, food purity regulatory sciences. What are the regulatory sciences?

Mr. HETHER. Keeping track of things like pesticides so we know what is going on and similar matters.

Mr. TOWNS. We are having trouble hearing you.

Mr. HETHER. I generally keep track of food safety matters with regard to pesticides and a variety of other issues.

Mr. HORN. In other words, basically it is the sciences that have regulatory implications?

Mr. HETHER. That is correct.

Mr. HORN. Do other firms have that type of position?

Mr. HETHER. I think that is correct.

Mr. HORN. In your area have you ever had an opportunity to look at the elementary school curriculum, and to what degree do you think they are up to date in terms of organic foods? We had a little dose, somewhere in elementary school, of what you should eat for a balanced diet, nutrition.

Often health education seems to be the first to go when there is a budget crunch in the schools. What is your reaction?

Dr. PRATT. The reaction I have right now is an incredible awareness on the part of educators that something is woefully missing. Schools I visit are a mismatch of misleading information in various parts of the food industry along with some beautifully put together food pyramids. It is a confusing array of things that are going on now that the children are primarily getting during the noon hour—very little nutritional information, no information that I know of in our area about organically grown foods.

Mr. HETHER. At Gerber, the idea of nutrition education is extremely important, and that is why at Gerber we have a program of nutrition education, particularly for new mothers, because they are the key to the future generation. So we have a system of consumer advice and we have a system of information to health professionals to provide that kind of information.

Mr. HORN. Well, I think that is excellent, because I think one of the great vacuums in our society is the ignorance of parents raising children; and you have a substantial reputation in that area and a substantial outreach system, and anything you could do to sneak up to people and educate them slowly as to their own self-interest in health would be helpful to the country.

Mr. HETHER. We agree.

Mr. HORN. Any other comments on that?

Mr. WINNE. I am not aware of any curriculum with our elementary schools that addresses sustainable agriculture. Environmental concerns are just cropping up in the curriculum now, which is probably a good place to start.

Our experience has been that when you have an opportunity to do some very direct hands-on education, such as taking school-age children to an organic farm, letting them see how it operates, giving them a chance to taste something which is organic, that is often the best type of education, especially for young children. It also draws their parents into the discussion at the same time.

Mr. LANDES. We operate in California not very far from your district, and we have an education center at our facility where at least twice a week local school groups are brought in and instructed by a group of nine registered dietitians who provide education in this regard. We also have an enormous amount of contact from throughout the country from teachers and health professionals who are seeking information on these issues specifically to build curriculum programs.

Mr. HORN. One last question. Why do organic foods cost more in the market? Let's start with the market and work back to production.

Dr. PRATT. Generally speaking, organic foods do cost more. They are in the range of 10 to 15 percent more, both our cost and at retail. There are some notable exceptions, however, and I pointed out the cereal category; the processed cereal category is one.

Marketing it is a complex game. Organic farmers, processors, and distributors sometimes are able to do things at a lower cost because of lower marketing and advertising costs. You do see some real values in organics, so it is unfair to say that the total organic package is more expensive without making those exceptions.

I believe the problem is one of supply and demand. As the demand increases, so will the supply. In fact, we have seen that happen; over the 3 years we have carried organic food, prices have come down.

Mr. HORN. I am wondering, having once been a farmer, if the farmer gets more for growing organic food or is it mostly the labeling, the processing, the advertising, and everything else that goes into it, because of the uniqueness, compared to the vast number of foods on the market?

Dr. PRATT. Personal communication I have had with a member of the Committee for Sustainable Agriculture on the west coast is that organic farmers now are profitable. Certainly the product looks a lot better. The prices are better.

I believe the organic farmer is finally reaching a point where he can make some money.

Mr. HORN. Any other comment from anybody else?

Mr. WINNE. We find that organic farmers will be drawn to a high-end market, better neighborhoods, more affluent neighborhoods; they will choose to sell to white-tablecloth restaurants because they can get a higher price in those places.

In terms of their costs, costs generally will be higher for a new farmer, someone who is acquiring land, buildings, equipment, having to amortize those costs over time; and for a farmer entering a transitional phase from conventional to organic production, yields will be down and costs may be higher.

There is a point where the costs are equaling out and there should not be a higher price. Farmers who are selling in lower or moderate-income areas are getting about the same price as their conventional counterparts.

Mr. LANDES. A couple of comments. We know from our experience that the farmers are being paid a premium price for these ingredients because we contract with them, often for several years before the products can qualify as organic. But when you get into processed foods in the marketplace, distribution channels are different. They go through distributors who generally work with a profit margin of approximately 25 percent and distribute to retail stores that traditionally use margins of 30 or 40 percent, whereas the same distribution and retail margins in tradition channels are about 8 and about 18 percent. So there is an inherent increase in the cost of the products on the basis of distribution.

We are seeing that, as distribution becomes more open to these types of products, the same margins apply and therefore the cost is coming down relative to other products.

Mr. HORN. Mr. Chairman, I am going to have to leave during the third panel. I want to commend you and your staff. I think this is one of the most interesting and fascinating, diverse set of witnesses I have seen in a congressional hearing.

Mr. TOWNS. Let me thank all the witnesses for their testimony. It has been very informative. Thank you again for coming and sharing time with us. Thank you.

Our third panel consists of experts in the field of alternative to chemical agriculture: Dr. Rhonda Janke, director of the Rodale Institute Research Center; Mr. Joseph Panetta, director of environmental and regulatory affairs for the Mycogen Corp.; Mr. Jim Knutzon, senior vice president of operations for Scientific Certification Systems; and Dr. Betty Marose from the University of Maryland.

STATEMENT OF DR. RHONDA JANKE, DIRECTOR, RODALE INSTITUTE RESEARCH CENTER

Ms. JANKE. I would like to thank the subcommittee for inviting me to testify today. I have prepared a number of comments, and I will briefly summarize those for you.

I represent the Rodale Institute, as well as the farmers that the institute works with. We work with 40 transitional natural growers who are reducing inputs, and we have a subscriber base of 50,000 farmers who read "The New Farm" magazine every month.

My background is in agronomy. I have been supervising the agronomic trails at Rodale for 7 years. I have a range of experience from around the country in terms of visiting farms and working closely with farmers.

First of all, I think that the question here—I would like to address Mr. Horn's questions of why does organic food appear to cost more in the marketplace. I would like to preface that by saying, I think that we are comparing not two food products but two food systems. As you have seen from the previous panel's comments, there is another food system developing to market organic produce, and it is a food system comparison.

Another question, is, what role does the government want to play in helping that food system develop and reach more consumers? The government at this point is playing a regulatory role with regard to residue, but it will get beyond that, how can the government support organic farmers and support consumers having access to healthy foods. The pieces are in place in the form of the National Organic Standards Board, which is developing national standards, the Sustainable Agriculture Research and Education Program that funds research through USDA. Chapter 3 in the farm bill provides funding for training for sustainable agriculture extension agents, but there is a lot more the Government can do.

I would like to summarize sections of my written testimony.

For field crops, Rodale has a track history of 13 years to research on sustainable field crop production. Once a farmer is through the transition period, field crops yield the same whether using organic or conventional methods. In the appendix, we have attached some

of our yields for 1986 through 1990 in rotation cycles, so you can see for yourselves.

The corn and soybean yields are the same. Wheat, oats are comparable to country averages. So we do get the same yield. Translated in economic terms, farmers get the same net profits; and this is using a standard marketing system and assuming no premium price.

These yields data are contrary to a frequently cited report done by Knutson in 1990 claiming that if we withdraw the use of pesticides from corn and soybeans, we will have decreases of 53 and 37 percent for corn and soybeans. I would like to dispute his study.

The reason that in some cases—one of the things that is not considered when we compare conventional and organic produce is that even though we can get the same yield and farmers if not certified organic are getting the same price, the off-site costs are not included in the price the farmers receive; and organic produce, especially the high-value crops, include some of-site costs. So current prices received by farmers don't reflect the true price of environmentally sound production.

For field crops, most can be grown organically in most parts of the country if farmers take a careful, slow approach to the transition.

Livestock is another system which hasn't come up in the discussion today, but organic livestock producers use a totally different system for production as well as marketing compared to the conventional producers, and I won't dwell on those comments.

Apples are in the news, and we have a research program on apples at Rodale. To briefly comment on my thoughts about that, apple production—currently, it is very difficult to grow certified organic apples with the same cosmetic standards a conventional apples. However, in the last few years significant research has been done to show that you can use things like the pheromone disruption ties to cut back on the pesticide use on apples; and a lot more research is needed to look for other biological control techniques and products.

Once the products are on the market, training needs to happen. Chapter 3 in the farm bill can help with extension agent and farmer training.

As far as vegetables and other high-value crops, in some cases labor is substituted for chemical use. Sometimes this costs more, but there are other costs incurred by vegetable producers—for example, in California, an almond grower, who has the registration cost from the State for being an organic grower and inspection and assessment fees for certification. These are just a few reasons why organic foods costs more.

Mr. TOWNS. Thank you.

[The prepared statement of Ms. Janke follows:]

Summary of Comments:

Rodale Press publishes Organic Gardening magazine, the world's largest gardening magazine, with a 50 year history of helping gardeners grow food without chemicals. Rodale Institute, founded in 1947, conducts research on organic field crop, vegetable and apple production, and publishes The New Farm, which reaches 50,000 subscribers, including farmers and farm professionals who seek to minimize their use of chemicals; 72% of the subscribers are active farmers. The Institute also works closely with a core of 40 farmers who are cutting back on their use of chemicals. These farmers make up the Institute's on-farm networks. These farmers conduct their own research and teach other farmer's their methods through on-farm field days and workshops.

I am here today to present some of the research data from our replicated trials conducted at the Rodale Institute Research Center in Pennsylvania, as well as the experiences of our 40 network farmers and the subscribers of The New Farm magazine. At Rodale I have supervised the field crops experiments and have worked closely with the network farmers for the past seven years, have worked with the agricultural economists who have used the Rodale data in various models. As Research Director I have had the opportunity to meet with other researchers and organic farmers throughout the country. My Ph.D. is in agronomy from Cornell, with minors in animal nutrition and plant ecology. I was raised on a dairy farm in central Kansas.

I will discuss some of the relevant points as they pertain to field crops, apples, vegetable crops, and animal agriculture, but I think the level of discussion needs to go beyond a commodity focus to problems and barriers that exist in the U.S. food system in general. Specific suggestions for change in this system are presented in the final section of my testimony. It is not the intent of organic producers to raise the cost of food beyond that which is affordable by the American people. As long as the off-site environmental costs of agriculture are passed literally "down-stream," the taxpayers will be paying for the true cost of food production one way or another; either at the grocery store or on their IRS 1040 forms each April.

Discussion points:

Field Crops

In 1981 we began to study the transition process that occurs when converting from conventional to organic farming. Three cropping systems were designed to represent three distinct farming operations; organic with animal manure and feed crops, organic green manure/cash grain rotation, and conventional corn-soybean rotation. This experiment is unique because we make

comparisons among systems over the long term, on the same site, using a statistically sound experimental design.

On average, corn and soybean yields in the Farming Systems Trial from 1986-1990 at Rodale have been the same in the organic systems as the conventional systems. Both systems are yielding above county averages. Organic wheat yields are coming out at the same level as county averages, and organic oat yields are higher than county averages (Peters et al. 1992).

This is contrary to Knutson et al.'s (1990) estimates of 53, 37 and 38% decreased in yields for corn, soybeans, and wheat respectively under organic conditions. His estimates were based on the opinion of 140 "leading crop scientists" from around the country, and not on actual data from long term cropping systems experiments. Therefore, Knutson's conclusions about the rising price of food and loss of jobs are moot points.

When farmers are surveyed (Shirley et al. 1992), 62% report no changes in yield, 7% report a yield increase, and 30% report a yield decrease when going through transition.

Yields (and net income) are often lower during the transition period, but can be the same or higher once they are through the transition (Peters et al. 1992, Hanson et al. 1990, Wagoner et al. 1993, Watt and Dahl 1993, Harper and Lindholm 1993). For these analyses, profitability was determined assuming current price structure, no premium price and existing marketing mechanisms.

General problems with the current food/agricultural system still exist however, among them:

- low return in general for farmers, high risk (only 4.49% return to investment according to the 1987 census of agriculture for farmers who gross over $10,000).

- off-site costs are not included in these calculations. Off site costs of conventional agriculture as measured by soil loss alone if included as "production costs" tip the balance in favor of organic crop rotations (Faeth et al. 1991).

- if off site costs were included, there is no mechanism now to pass on this cost to consumers.

- current input costs do not reflect the true cost of energy, leading to higher use of non-renewable resources (oil) through pesticide

and nitrogen fertilizer use (Chou 1993).

- Summary: In general, most field crops can be grown organically in most regions of the country at comparable yields if nitrogen fertilizer and pesticides are withdrawn slowly and with careful planning; thus corn and soybean prices would not go up appreciably in the foreseeable future. However, these crops are generally fed to livestock.

Livestock

- US producers have moved away from integrated crop/livestock systems towards specialized crop and specialized (often confinement) livestock systems. This specialization leads to:

  Use of low-level antibiotics to control chronic diseases
  More potential for disease epidemics, e.g. the avian flu decimation in the poultry industry
  Concerns by animal rights activists

  Manure handling/concentration problems in certain regions of the country
  No crop/livestock synergy or price buffering, farm profit margin slims, and techniques like hormone use become "necessary" for profit.

- By contrast, organic livestock producers use:

  1) Organically grown grains
  2) Non-confinement methods
  3) No maintenance doses of antibiotics or other drugs
  4) Careful screening and consideration of substances used in remedial cases (such as for parasite control, etc.)
  5) Animal disease control is based on preventative techniques such as diet.

- The cost of organic meat production will reflect these systematic changes in the way the operations are run. To my knowledge no national studies of the cost of organic meat production have been performed to date. As with vegetables, discussed below, the higher costs of organic meat in the market place today reflect an industry in its infancy, with a limited number of producers, and few developed marketing channels. Organic meat producers do not generally have the cost-cutting advantages of economies of scale, but at the whole farm level have the advantages of integrated crop-livestock systems, diversity of enterprises, local markets, and the opportunity to market other value-added products from the farm such as compost.

Apples:

- A small group of organic producers do exist now in the U.S. who supply organic apples to a specialized consumer market and make a living at it. However, with current pest control technologies, it is difficult to get a reasonable percentage of "marketable" fruit. Currently these growers need a cider or process market as back-up.

- New technologies are under development that can decrease the cost of organic apple production and include:

-disease resistant trees, which greatly reduces the costs of sulfur and other fungicide applications.
-pheromone disruption for codling moth which is and effective part of an integrated plan will become more price competitive as it becomes more widely used (about $150.00/acre now).
-tufted apple bud-moth pheromone is under testing now, and could be available soon.
-many beneficial insects that attack apple pests are undeveloped; for example a researcher at Penn State looking for leaf roller parasites this past year discovered 32 in a two-county area of PA, 3 of which hadn't even been classified by insect taxonomists. These beneficial insects could one day become commercially important for organic growers.
-visual traps and lures which are used to control the apple maggot fly.
-the interactions of beneficial mites and pest mites which are still poorly understood.

Research is underway today to look for solutions for the plum curculio, as well as to continue field testing of the codling moth, tufted apple budmoth, and apple maggot control systems. Plum curculio is the most significant pest without organic options in the northeast. More research is needed on the efficacy of understory plantings to provide habitat for beneficial insects, parasitic (beneficial) nematodes, and other non-chemical solutions. As pesticide use is decreased or eliminated, an different complex of beneficials and pests is created; more research is needed to develop a "whole systems" approach for regionally based production.

Many of the biologically based systems are more information intensive than conventional controls, and growers will need training and information of the new techniques before they will have confidence in the alternatives. The 1990 Farm Bill mandates cooperative extension training in sustainable agriculture; thus a mandate exists for more government sponsored training activities.

Vegetables and other high value crops:

- The cost of vegetables will depend on the crop, market, handling and storage system used. In general:

- For some crops hand labor is substituted for machine, e.g. hand weeding, but in some cases this is not an issue.

- However, more mechanization is available every year..better cultivators, flame weeding, bug vacs, more bio-control; each vegetable needs to be considered on a case by case basis, region by region.

- Some system or structural changes may need to take place for organic production to be feasible, not all of the changes mean out-of-pocket costs, for example things like land ownership patterns in some regions have grain crops and veg crops concentrated on single farms, with land swaps and/or farm diversification, crop rotation can take care of diseases and fertility problems.

- Documentation of the cost of production of several high value crops has been done by Asai et al. (1992). Some interesting highlights of three comparative studies of almond production in California reveal that organic producers incur several costs not born by conventional producers. In addition to organic certification costs for membership, inspection, and an assessment fee of 0.5% of gross sales, amounting to $1120 for the simulated farm, the state of California requires a registration fee of $300 (assuming a gross sales of $164,000) for organic producers (but not for conventional producers).

The organic scenario also assumed production on a 45 acre farm as compared to 90 acres for the conventional, and 1550 lb/acre yield for organic as compared to 2000 lb/acre for conventional. The study notes that yields on organic farms can range from 800 to 2300 lb/acre. Since wholesale markets do not exist for organic almonds, processing costs were also incurred on the organic farm. The net result is that in California, prices received by organic producers range from $2.05 to $2.70 per meat pound for a 25 pound packaged box. In contrast, the average price received by conventional producers ranges from $0.78 to $1.92 per meat pound in bulk.

Where the organic food industry is at today:

Other panels can comment better than I, but my perception is that the industry is still in its infancy...

Certification standards still being developed on a national basis, and on a state or organizational basis have only been around a few years. For example, even well established organizations like OCIA (Organic Crop Improvement Association) and California Certified Organic Farmers have been active for about a decade. These organizations are still growing and certifying new farmers at an exponential rate.

Many producer information organizations are still young too, e.g. the Pennsylvania Association for Sustainable Agriculture (PASA) has existed for only two years; the Practical Farmers of Iowa came into being only about five years ago.

Markets still new, underdeveloped, and many are untapped. Even in Kutztown, 3 miles from Rodale, we cannot obtain locally grown organic food. We made a concerted effort to provide 100% organic locally grown food for our field day lunches this year and discovered that there is only one organic mushroom producer in country for example (see attached description in Appendix C.).

However, some of the high price is due to the youth of the industry. The industry includes many small growers, few marketing channels, still small flow of volume, and the economies of scale have not kicked in yet.

Also, the gourmet market is there for the small grower of a high value crop; it is a good way to enter the market, produce high quality product, pay some bills. This doesn't mean that all organic growers will go for this market, and some use this market to subsidize other food that is sold at a lower price at the local Farmer's Markets and or donated to food banks.

Larger Issues:

In our society today, food and the cost of producing it is taken for granted.

Several million (billion) dollars of research money has been spent on conventional, chemical techniques for farming since the 1940's, and only a fraction of USDA's research budget even today goes specifically towards . Granted, some portion of the "basic research funded by USDA and NRI supports low-input agriculture, IPM (integrated pest management), and occasionally bio-control, but...

- a certain amount also still goes for research which is antagonistic to low-input, or supports the continued use of certain products, for example, the development of herbicide resistant crops.

- Many USDA projects are written in such a way that it is impossible for an outside review team to determine if the project is of value to organic producers or not...need interpretation by someone involved, because the new USDA reports use the jargon, but may not have substance. I was on one of those review panels, and support the review process, but found the panels needed more information about each project (in some cases, specific outcomes) and also needed to see the big picture, e.g. how is funding allocated and prioritized. Each panel only scrutinized a portion of the USDA project portfolio.

- Once more research money is spent on appropriate bio-control, and ecological solutions to problems, the availability of these technologies can help bring down the costs of pest control.

- The marketing of organic pest solutions is also in it's infancy....there are only a few companies marketing bio-control products, and technologies readily available to growers are dominated by IPM techniques. There is virtually no incentive for large industry to pick up on this market because of low-return potential for the products that work. B.t. is a notable exception, but it is similar to chemical spray products in application technique, has a reasonable shelf life, and needs to be applied more than one time per season usually.

What the government can do to keep organic food prices in the reasonable range:

1. Create Non-Profit Organizations to Supply Bio-Control Products and Legume Seed to Farmers

There is a need to create non-profit, eventually self-supporting micro-industries to produce the basic tools required by organic producers. Producers won't always need to purchase inputs every year, since one of the philosophies of organic production is to use on-farm, or internal resources more than external. A few items that would be helpful include:

- legume seed, particularly the vetches, hairy, common, lana, big flower vetch, the medics, more screening for new legumes, and some plant breeding work.

- bio-control products like beneficial insects, and continued technologies for enhancement of natural bio-control mechanisms, like disease propagation on certain weeds. Also needed are R & D on equipment to propagate, store, and transport live organisms to the farms. More data is needed on efficacy of "habitat enhancement techniques" like under-story and strip crop planting of beneficial insect habitat plants.

2. Remove Barriers to On-Farm Composting

- EPA at the national level should work with state and local agencies to amend laws that restrict the mixing on farms of yard waste, animal manures, and other compostable materials such as food waste. Instead, methods and standards should be established for grading compost for safety and nutrient content. fertility not an issue on many farms, if access to manures, green manures, composts. However, EPA and their sister state level agencies could help out by speeding up the process of allowing more compostable materials on farms, for use in composting operations and fertility programs. For example, in Pennsylvania farmers can't combine leaves and manure yet, Rodale can't compost our own paper plates, etc. without an expensive 1-year application procedure. Tipping fees for composting would be another possible source of income for organic farmers.

3. Re-Focus Farm Program Benefits

- Subsidies to farmers should de-emphasize "program crops" such as corn, wheat and cotton and encourage diversification to those that use less chemical inputs. Program benefits would ideally be targeted for farmers showing environmental and soil quality improvements on their farms.

- We need to remove the current subsidies for conventional producers that create a competitive advantage. For example the 1990 farm bill removed some barriers which allowed for "flex acres" and rotation of crops, but this program is being poorly advertised and administered; inconsistent rules from region to region, and is not really being implemented.

4. Re-allocate Research $ to Biological Solutions

-The Sustainable Agriculture Research and Education (SARE) program of USDA should be fully funded to $50 million (from its current $6.7 million appropriation.

-Encourage the adoption of sustainable policy in the competitive grant process for the National Research Initiative (NRI). Current competitive grants are slated for bio-tech research and industrialization of ag products. Categories for fundamental research on soil biology and crop ecology are grossly under-funded or do not exist at all.

- More studies need to be conducted on preventing off-farm impacts of current farming practices, such as groundwater contamination, drift from chemical sprayers, and pesticides in rainwater and fog.

5. Remove Financial Barriers for the Organic Foods Industry

- Fully fund the National Organic Standards Board so that it can do the job mandated by congress (Organic Foods Production Act, Title XXI of the 1990 Farm Bill). Fund the certification process so that the full burden of inspection, validation, and record keeping do not fall on the producers or processors.

- Remove additional barriers such as the "Organic Producer's Registration Fee" that exist in states like California.

In Conclusion:

The Rodale Farming Systems Trial has confirmed that an organic, diversified cash grain operation can produce yields and net profits comparable to conventional grain production systems. This is a viable system that is available now for field crop producers. Currently the soil quality implications of twelve years of organic management are being jointly studied by USDA scientists and Rodale scientists at our site in Pennsylvania. More long term research is needed at other locations, in other environments, with other crops, to develop cropping systems that are healthy for soil, healthy for the environment, and healthy for people.

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APPENDIX A. RODALE FARMING SYSTEMS YIELDS 1986-1990

(FROM PETERS ET AL. 1992)

Table 7. Corn grain yield[1]
(bu/a)

Cropping System	Previous crop	1986	1987	1988	1989	1990
LIP-A	Hay	172a	—	110a	124[2]ab	—
LIP-CG	Green Manure	137b[3]	144a	109a	111c	149a
CONV	Corn	166a[4]	130a	85b	116bc	—
CONV	Soybeans	168a[4]	139a	104a	130a	158a
Berks County Avg.[5]		102	93	70	105	120

1. Values within the same year followed by the same letter are not significantly different from one another (.05 level).
2. Omitted one replicate (rep 6) due to flooding.
3. Short season (95 day) corn variety
4. Both conventional corn treatments in 1986 were preceded by a soybean crop in 1985
5. The source for the Berks county yield averages is: Statistical Summary 1986-1990 and Pennsylvania Department of Agriculture Annual Report. Pennsylvania Agricultural Statistics Service.

Table 14. Weed biomass in corn
(dry weight lbs/a)

Cropping System	Previous Crop	1986	1987	1988	1989	1990
LIP-A	Hay	223b	—	900a*	1322a	—
LIP-A	Soybean	669a	—	799a	—	517a
LIP-CG	Gr.Manure	702a*	467a	449b	110c	657a
CONV	Corn	143b[1]	106b	250bc	487b	—[2]
CONV	Soybeans	366b[1]	61b	88c	252bc	9b

* Significantly negative effect of weeds on corn grain yields (see Table 15).
1. Both conventional corn treatments in 1986 were preceded by a soybean crop in 1985
2. Only one conventional corn treatment in 1990

Table 15. Corn grain yields (bu/a) in plus/minus weed subplots

Cropping System	Previous Crop	1986		1987		1988		1989		1990	
		Plus	Minus	Plus	Minus	Plus	Minus	Plus	Minus	Plus	Minus
LIP-A	Hay	173	178	—	—	108*	136	126	132	—	—
LIP-A	Soybean	180	167	—	—	—	—	—	—	141	150
LIP-CG	Green manure	130*	141	142	155	146	172	116	113	157	151
CONV	Corn	185	169	140	127	95	99	119	118	—	—
CONV	Soybean	170	174	139	141	119	128	126	142	140	162

*Significant yield reduction ($p < .05$) in ambient (plus) weed subplots compared to corresponding weed-free (minus) subplots

Table 17. Soybean population
(plants/acre)

Cropping System	1986	1987	1988	1989	1990
LIP-A	—	148,104b	—	116,300b	171,685a
LIP-CG	155,727a	142,585b	—	101,900[1]b 112,400[2]b	106,781c
CONV	179,162a	221,886a	105,110	159,000a	124,494b[3]

1. Barley harvested (reps 1,2,4,7)
2. Barley not harvested (reps 3,5,6,8)
3. trt 3-1 only

Table 20. Weed biomass in soybean
(dry weight lb/a)

Cropping System	1986[1]	1987	1988	1989	1990
LIP-A	—	1492a*	—	—[2]	114b
LIP-CG	446a	361b	—	487a*	391a
CONV	312a	115c	325a	162b	343a
Sampling date:	9/18	8/4	8/8	8/15	8/2

*Significant effect of weeds on crop yields

1. Plus/minus weed subplot measurements not taken in 1986
2. Weed biomass was not measured on 8/15 for this treatment but yields taken from plus/minus weed subplots indicated no adverse effect on yields when weeds were present.

Table 19. Soybean seed yields
(bu/a)

Cropping System	1986	1987	1988	1989	1990
LIP-A	—	44b	—	43a	47a
LIP-CG[1]	48a	44b	—[2]	33b[3]	29c
CONV	42b	53a	49a	46a	39b (trt 3-1) 42b (trt 3-3)
County Ave.	38	38	36	35	43

1. LIP-CG soybeans relay cropped with spring barley (1986, 1988, 1989, 1990) or winter wheat (1987)
2. not harvested due to drought
3. only four reps (1,2,4,7) harvested for soybean yield & no barley harvested; other four reps (3,5,6,8) harvested for barley had much lower soybean yield (16 bu/a) and were not included in the table above

Table 21. Relay cropped small grain[1] and soybean[2] seed yields (bu/a)[3]

Year	Cropping System	Small grain Yield	Soybean Yield
1986	LIP-CG	29	48
1987	LIP-CG	32	44
1988	LIP-CG	61	Crop failure
1989	LIP-CG	Crop failure	33
1990	LIP-CG	38	29

1.- Spring barley in 1986, 1988, 1989, 1990; Wheat in 1987.
2.- These soybean yields are also reported in Table 19.
3.- The barley yields are adjusted to 12% moisture and the soybean yields are adjusted to 13% moisture

Table 26. Wheat grain yields (bu/a @ 12% moisture)

Year	Cropping System	Yield	County average
1986	LIP-A	44	43
1987	LIP-A	49a	45
	LIP-CG	41b	45
	LIP-CG[1]	32c	45
1989	LIP-A	45a	35
	LIP-CG	44a	35

1.- Relay cropped with soybeans

Table 28. Oat grain yields (bu/a @ 12% moisture)

Year	Cropping System	Yield	County average
1986	LIP-CG	75	55
1988	LIP-CG	106	59
1990	LIP-CG	108	70

APPENDIX B. RODALE LOW INPUT REDUCED TILLAGE TRIAL - CORN PRODUCTION COSTS.

- 1991 CONVENTIONAL INPUTS, CHISEL PLOW
- 1991 ORGANIC INPUTS, CHISEL PLOW
- 1989 CONVENTIONAL INPUTS, NO-TILL
- 1989 ORGANIC INPUTS, NO-TILL AS PART OF A TILLAGE ROTATION SYSTEM

CROP BUDGET SUMMARY FOR CORN GRAIN
FOR: Rotation 2 1991

			ECONOMI COSTS/AC	CASH COSTS PER ACRE
INCOME				
-Sale of Crop	120.354	Mkt. Yld. Goal	$336.99	$336.99
-ASCS Def. Pmt.	0	ASCS YLD	$0.00	$0.00
-Crop Insurance			$0.00	$0.00
GROSS INCOME			$336.99	$336.99
	* RESOURCE COMMITTMENT *			
DIRECT COSTS ON	120.354 (bu/ac)			
-Seed			$16.30	$16.30
-Herbicides			$16.75	$16.75
-Fungicides			$0.00	$0.00
-Insecticides			$0.00	$0.00
-Fertilizer			$35.00	$35.00
-Crop Insurance			$0.00	$0.00
-Custom Work			$0.00	$0.00
-Fuel			$7.98	$7.98
-Lubrication			$1.20	$1.20
-Repairs			$12.79	$12.79
-Machinery/Tractor Rental			$0.00	$0.00
-Drying			$0.00	$0.00
-Hauling			$4.21	$4.21
-Hired labor (machine time + 10%)			$12.87	$12.87
-Interest on Operating:		6 MONTHS	$5.35	$5.35
TOTAL DIRECT COSTS			$112.44	$112.44
INDIRECT (FIXED) COSTS				
-Land Taxes			$0.00	$0.00
-Cash Rent			$90.00	$90.00
-Tractor Investment			$6.25	------NA----
-Self Propelled Imp. Investment			$8.23	------NA----
-Pulled Implement Investment			$10.28	------NA----
-Depreciation on machinery			$101.27	------NA----
-Land Investment			$0.00	------NA----
TOTAL INDIRECT COSTS			$216.03	$90.00
TOTAL ALL COSTS			$328.47	$202.44
RETURN (TO UNPAID OP. LABOR + MGMT)				
-Over Direct Costs			$224.55	$224.55
-Over Direct and Fixed Costs			$8.52	$134.55
* COSTS ON A PER UNIT BASIS *				
-Direct Costs			$0.93	$0.93
-Indirect (Fixed) Costs			$1.79	$0.75
-Direct and Indirect Costs			$2.73	$1.68

CROP BUDGET SUMMARY FOR CORN GRAIN

	FOR: Rotation 10 1991		ECONOMI COSTS/AC	CASH COSTS PER ACRE
INCOME				
-Sale of Corn	129.954	Mkt. Yld. Goal	$363.87	$363.87
-Sale of Rye	0	Mkt. Yld. Goal	$0.00	$0.00
-Sale of Hvetch	0	Mkt. Yld. Goal	$0.00	$0.00
-ASCS Def. Pmt.	0	ASCS YLD	$0.00	$0.00
-Crop Insurance			$0.00	$0.00
GROSS INCOME			$363.87	$363.87
	* RESOURCE COMMITTMENT *			
DIRECT COSTS				
-Seed			$55.60	$55.60
-Herbicides			$0.00	$0.00
-Fungicides			$0.00	$0.00
-Insecticides			$0.00	$0.00
-Fertilizer			$0.00	$0.00
-Crop Insurance			$0.00	$0.00
-Custom Work			$0.00	$0.00
-Fuel			$11.77	$11.77
-Lubrication			$1.77	$1.77
-Repairs			$16.91	$16.91
-Machinery/Tractor Rental			$0.00	$0.00
-Drying			$0.00	$0.00
-Hauling			$4.55	$4.55
-Hired labor (machine time + 10%)			$18.32	$18.32
-Interest on Operating:		6 MONTHS	$5.45	$5.45
TOTAL DIRECT COSTS			$114.36	$114.36
INDIRECT (FIXED) COSTS				
-Land Taxes			$0.00	$0.00
-Cash Rent			$90.00	$90.00
-Tractor Investment			$6.25	-----NA----
-Self Propelled Imp. Investment			$8.23	-----NA----
-Pulled Implement Investment			$12.54	-----NA----
-Depreciation on machinery			$110.49	-----NA----
-Land Investment			$0.00	-----NA----
TOTAL INDIRECT COSTS			$227.50	$90.00
TOTAL ALL COSTS			$341.86	$204.36
RETURN (TO UNPAID OP. LABOR + MGMT)				
-Over Direct Costs			$249.51	$249.51
-Over Direct and Fixed Costs			$22.01	$159.51
* COSTS ON A PER UNIT BASIS *				
-Direct Costs			$0.88	$0.88
-Indirect (Fixed) Costs			$1.75	$0.69
-Direct and Indirect Costs			$2.63	$1.57

CROP BUDGET SUMMARY FOR CORN GRAIN
FOR: Rotation 4 1989

			ECONOMI COSTS/AC	CASH COSTS PER ACRE
INCOME				
-Sale of Crop	146	Mkt. Yld. Goal	$408.80	$408.80
-ASCS Def. Pmt.	0	ASCS YLD	$0.00	$0.00
-Crop Insurance			$0.00	$0.00
GROSS INCOME			$408.80	$408.80
* RESOURCE COMMITTMENT *				
DIRECT COSTS ON	146 (bu/ac)			
-Seed			$16.30	$16.30
-Herbicides			$58.06	$58.06
-Fungicides			$0.00	$0.00
-Insecticides			$0.00	$0.00
-Fertilizer			$35.00	$35.00
-Crop Insurance			$0.00	$0.00
-Custom Work			$0.00	$0.00
-Fuel			$3.94	$3.94
-Lubrication			$0.59	$0.59
-Repairs			$9.67	$9.67
-Machinery/Tractor Rental			$0.00	$0.00
-Drying			$0.00	$0.00
-Hauling			$5.11	$5.11
-Hired labor (machine time + 10%)			$5.89	$5.89
-Interest on Operating:		6 MONTHS	$6.73	$6.73
TOTAL DIRECT COSTS			$141.28	$141.28
INDIRECT (FIXED) COSTS				
-Land Taxes			$0.00	$0.00
-Cash Rent			$90.00	$90.00
-Tractor Investment			$3.70	-----NA-----
-Self Propelled Imp. Investment			$8.23	-----NA-----
-Pulled Implement Investment			$6.23	-----NA-----
-Depreciation on machinery			$74.28	-----NA-----
-Land Investment			$0.00	-----NA-----
TOTAL INDIRECT COSTS			$182.43	$90.00
TOTAL ALL COSTS			$323.72	$231.28
RETURN (TO UNPAID OP. LABOR + MGMT)				
-Over Direct Costs			$267.52	$267.52
-Over Direct and Fixed Costs			$85.08	$177.52
* COSTS ON A PER UNIT BASIS *				
-Direct Costs			$0.97	$0.97
-Indirect (Fixed) Costs			$1.25	$0.62
-Direct and Indirect Costs			$2.22	$1.58

CROP BUDGET SUMMARY FOR CORN GRAIN

	FOR: Rotation 13 1989	ECONOMI COSTS/AC	CASH COSTS PER ACRE
INCOME			
-Sale of Corn	140 Mkt. Yld. Goal	$392.00	$392.00
-Sale of	0 Mkt. Yld. Goal	$0.00	$0.00
-Sale of H. Vetch	0 Mkt. Yld. Goal	$0.00	$0.00
-ASCS Def. Pmt.	0 ASCS YLD	$0.00	$0.00
-Crop Insurance		$0.00	$0.00
GROSS INCOME		$392.00	$392.00
	* RESOURCE COMMITTMENT *		
DIRECT COSTS			
-Seed		$39.34	$39.34
-Herbicides		$0.00	$0.00
-Fungicides		$0.00	$0.00
-Insecticides		$0.00	$0.00
-Fertilizer		$0.00	$0.00
-Crop Insurance		$0.00	$0.00
-Custom Work		$0.00	$0.00
-Fuel		$7.14	$7.14
-Lubrication		$1.07	$1.07
-Repairs		$11.77	$11.77
-Machinery/Tractor Rental		$0.00	$0.00
-Drying		$0.00	$0.00
-Hauling		$4.90	$4.90
-Hired labor (machine time + 10%)		$10.56	$10.56
-Interest on Operating:	6 MONTHS	$3.74	$3.74
TOTAL DIRECT COSTS		$78.52	$78.52
INDIRECT (FIXED) COSTS			
-Land Taxes		$0.00	$0.00
-Cash Rent		$90.00	$90.00
-Tractor Investment		$6.25	-----NA-----
-Self Propelled Imp. Investment		$8.23	-----NA-----
-Pulled Implement Investment		$12.44	-----NA-----
-Depreciation on machinery		$110.08	-----NA-----
-Land Investment		$0.00	-----NA-----
TOTAL INDIRECT COSTS		$226.99	$90.00
TOTAL ALL COSTS		$305.51	$168.52
RETURN (TO UNPAID OP. LABOR + MGMT)			
-Over Direct Costs		$313.48	$313.48
-Over Direct and Fixed Costs		$86.49	$223.48
* COSTS ON A PER UNIT BASIS *			
-Direct Costs		$0.56	$0.56
-Indirect (Fixed) Costs		$1.62	$0.64
-Direct and Indirect Costs		$2.18	$1.20

Mr. TOWNS. Mr. Panetta.

STATEMENT OF JOSEPH PANETTA, DIRECTOR OF ENVIRONMENTAL AND REGULATORY AFFAIRS, MYCOGEN CORP.

Mr. PANETTA. Thank you for inviting me to testify today on this very important issue of the economic viability of growing crops with minimal use of chemical pesticides.

My name is Joe Panetta. I am director of environmental and regulatory affairs for Mycogen Corp. We are a diversified agricultural biotechnology company.

Congressman Horn, I believe, earlier asked if this is an either/or question with regard to use of chemicals. I want to reassure you that from our standpoint it is not. We are developing and marketing environmentally compatible effective biopesticides to control pests, for improving crop varieties to increase food production, such as a corn plant that is resistant to insect attack.

We were the first company several years ago to receive EPA approval for genetically engineered biological pesticide containing a naturally occurring pest toxin from the *bacillus thuringiensis* or Bt bacterium.

We have inserted the toxin into another kind of bacterium, which is then killed, and we stabilize the toxin within the cell wall. We call this the CellCap process and farmers find that the encapsulated toxin lasts twice as long as traditional Bt in the field.

We have several EPA-approved products, but we are not alone in this pursuit. Many other biotech and chemical companies have invested heavily in research to find alternative pest control agents. The U.S. biopesticides industry has invested a total of approximately $300 million in the discovery, research, development, and commercialization of natural pest control products. The average research and development expenditure in 1990 for six leading biopesticides companies was about $5 million. By 1992, this average had increased by 73 percent to $8.7 million. We fully expect that biological approaches to pest control, including the use of microbial pesticides and transgenic plants, will play an increasing role in integrated pest management in the future.

We have conducted an extensive research and development program to develop a diverse array of biopesticide products and technologies. We have used biotechnology and genetic engineering techniques, including the CellCap process, to develop highly effective and cost competitive microbial biopesticides. CellCap technology has been shown to prolong natural insecticidal activity of Bt toxin to the extent that application can result in crop protection that is superior to that of traditional chemicals.

We are currently marketing three CellCap products: MVP, which controls caterpillar pests in leafy vegetables; M-Trak, which controls beetle pests in potato and tomato plants; and M-Peril for the control of European corn borer in corn.

We are able to offer these products to farmers at costs ranging from equal to that of a comparable chemical to about 25 percent higher, depending upon the crop. We expect to continue to reduce these costs as manufacturing efficiency improves and volumes increase. These savings are passed on to consumer food prices as well.

We are using the CellCap technology to develop additional bio-insecticide products for agricultural markets based on different bio-toxins effective against such economically important pests as the armyworm in vegetable crops, the cotton bollworm and the alfalfa weevil. We can take these toxins produced by Bt and use them even more effectively through incorporation of the genes in the plants to develop hybrid corn varieties such as corn and cotton that are resistant to pests. Our researchers have isolated dozens of Bt strains that produce toxins with highly specific pesticidal activity against caterpillar and beetle pest, thereby reducing or even eliminating the need for chemical applications.

We believe that by delivering to farmers planting seeds with pest resistant characteristics, we can offer added value to farmers in the seeds they plant. By focusing on corn and cotton initially, we believe that we will be targeting two of the largest crops in terms of pesticide sales. We are collaborating with a large seed company to bring transgenic hybrid corn seeds to market within the next 5 years, and the commercialization of these plants will provide an important new crop-protection option to farmers. We anticipate that there will be substantial economic incentive to the farmer to purchase our insect-resistant corn versus the cost of traditional corn plus a pesticide application.

In summary, the products that I have discussed, when combined with systems of organic farming, integrated pest management, and low-input sustainable agriculture, all offer methods by which growers can effectively reduce the use of conventional pesticides, thereby lowering residues in foods.

Although we feel that certain chemical pesticides will be needed well into the next century, both traditional chemical companies and biotech firms are committed to finding alternatives to replace noxious products and to safely and effectively control chemically resistant pests.

A wide array of new products have been developed. Many have been tested in the field. The problem is that most are stalled within EPA awaiting registration. The prolonged delay before commercialization troubles farmers and companies alike. While we await EPA approval of our products, farmers—and consequently the public—are denied an array of effective alternatives.

Congress needs to realign EPA priorities to assure that farmers will have available new pesticides when they lose chemicals denied registration or reregistration due to food safety concerns. In addition to EPA's effort, we believe that more coordination is needed between EPA and USDA's Cooperative Extension Service, which has often been the primary source of information on synthetic chemical pesticides, their proper handling and usage. These same channels of communication can impart information about the potential advantages of using biological pesticides and proper application necessary to ensure productive results.

Mr. Chairman, in closing, I believe that over the last 5 years Mycogen and others have demonstrated that economically viable biopesticides can and have been commercialized and are being used successfully by farmers. The growing field of biotechnology will in the future provide even better answers to chemical and food safety issues. I also believe that with greater public commitment to ac-

ceptance of biopesticides, these products will be available without delay.

Thank you very much.

Mr. TOWNS. Thank you very much, Mr. Panetta.

[The prepared statement of Mr. Panetta follows:]

Thank you, Mr. Chairman, and all the members of the Subcommittee for inviting me to testify on the economic viability of growing agricultural crops with minimal use of chemical pesticides.

I am Joe Panetta, Director of Regulatory and Environmental Affairs of Mycogen Corporation, a diversified agricultural biotechnology company. We develop and market environmentally compatible, effective biopesticides to control pests. We also improve crop varieties to increase food production, such as a corn plant that is resistant to insect attack. Mycogen was the first company to receive EPA approval for a genetically engineered biological pesticide, containing a naturally occurring pest toxin from the Bacillus thuringiensis (Bt) bacterium. The toxin is inserted into another kind of bacterium which is then killed, stabilizing the toxin within its cell wall. We call this the CellCap® process. Farmers find the encapsulated active ingredient lasts twice as long as traditional Bt in the field.

Mycogen has several EPA approved products; however, we are not alone in this pursuit. Many other biotech and chemical companies have invested heavily in research to find alternative pest control agents. The U.S. biopesticides industry has invested a total of approximately $300 million in the discovery, research, development and commercialization of natural pest control products. The average research and development expenditure in 1990 for six leading biopesticides companies was about $5.0 million; by 1992 this average had increased by 73% to $8.7 million. We expect biological approaches to pest control, including the use of microbial pesticides and transgenic plants, to play an increasing role in Integrated Pest Management (IPM) strategies.

Worldwide, approximately $21 billion is spent annually on crop protection products, primarily synthetic chemical pesticides. Pesticide expenditures in the U.S. alone are approximately $5 billion annually; despite these expenditures, major crop losses are still incurred due to destructive pests.

Many chemical pesticides have efficacy, environmental or regulatory disadvantages, and many pests often develop resistance to chemical pesticides. Pest control problems are compounded by an increasing public awareness of possible hazards associated with the use of chemical pesticides. Concerns over chemical pesticide residues in food products and groundwater have led the EPA to prohibit or restrict the use of many chemical pesticides. The costs associated with obtaining a product registration for chemical pesticides have increased dramatically. During the last few years, there have been only a few new synthetic pesticides registered in the U.S., primarily due to the long time and high costs associated with registration. In 1992, 90% of the new active ingredients registered by EPA were biological pesticides, rather than synthetic chemicals.

The U.S. pesticide market is well established and mature. However, we have found through our experience that new biological and naturally-derived products shown to be more cost effective than existing products can achieve significant market penetration. Historically, biopesticides have represented a small segment of the market, accounting for less than one percent of pesticide sales. This primarily has been due to the limited

efficacy and availability of biopesticides, the understanding and acceptance by farmers and the preference by farmers for more broad-spectrum products. Recently, farmers have been implementing IPM programs that increasingly include biopesticides to control chemical-resistant pest populations and to reduce chemical pesticide residues. Implementation of IPM programs is most advanced in specialty crops where there is increased demand for highly specific pesticide products, such as our biopesticides, to protect crops without leaving residues in food or groundwater.

Our business strategy for the entire ten years of our existence as a company has been to develop, manufacture, and market biopesticides to address the market demand for such products. Our products are based on natural agents such as microorganisms and fatty acids. In general, these products have specific toxic activity on target pests and weeds, and are not harmful to humans, fish, birds or nontarget insects. They degrade rapidly and therefore do not leave residues on food crops. As a result, biopesticides are subject in certain cases to a limited group of regulatory tests that reduce the time and cost required to bring new products to market. We estimate that a new synthetic chemical for crop use requires 7 years for EPA approval at an investment of $10 million, while a new biological requires less than 2 years for EPA approval at an approximate cost of $500,000.

We conduct an extensive research and development program at Mycogen to develop a diverse array of biopesticide products and technologies. We use biotechnology and genetic engineering techniques, including the CellCap process, which I mentioned earlier, to develop highly effective and cost competitive microbial biopesticides. The CellCap

technology has actually been shown to prolong the insecticidal activity of Bt toxin to the extent that application can result in crop protection which is superior to that of traditional chemicals. We currently market three CellCap products: MVP for control of caterpillar pests in leafy vegetables; M-Trak, for control of Colorado potato beetle in potato and tomato plants; and M-Peril for control of European corn borer in corn.

Commercial manufacture of our microbial biopesticide products involves large scale fermentation processes in which the microorganisms are reproduced in mass quantities. After fermentation, the microorganisms are harvested and concentrated for formulation. The concentrated microorganisms are processed in different ways, depending on whether a liquid or dry product formulation is to be produced. Farmers will not use a biological product if application requires an investment in unique equipment, so it is essential to formulate our products to a form in which they can be used in traditional spray equipment, aerial applicators and chemigation systems. Manufacturing costs have decreased steadily since production of our first products began in 1988. We are able to offer our products to farmers at costs ranging from equal to that of a comparable chemical to about 25% higher, depending upon the crop. We expect to continue to reduce these costs as manufacturing efficiency improves and volumes increase.

We are using the CellCap technology to develop additional bioinsecticide products for agricultural markets based on different biotoxins effective against such economically important pests as the armyworm in vegetable crops, cotton bollworm and the alfalfa weevil.

The toxins produced by Bt can be used even more effectively through incorporation of the Bt genes into plants to develop hybrid crop varieties, such as corn and cotton, that are resistant to pests. Our researchers have isolated dozens of Bt strains that produce toxins with highly specific pesticidal activity against caterpillar and beetle pests, thereby reducing or even eliminating the need for chemical application. We believe that by delivering to farmers planting seeds with pest-resistant characteristics, we can offer added value to farmers in the seeds they plant. By focusing on corn and cotton initially, we believe that we will be targeting two of the largest crops in terms of pesticide sales. We are collaborating with Ciba Seeds to bring transgenic corn hybrid seeds to market within five years; the commercialization of these plants will provide an important, new, crop protection option to farmers. We anticipate that there will be substantial economic incentive to the farmer to purchase our insect resistant corn versus the cost of non-insect resistant corn plus a pesticide.

Our scientists have developed, and are applying accelerated plant breeding techniques that significantly reduce the time required to breed complex genetic traits in plants. As an example, several genes in the corn plant that enhance natural resistance to the European corn borer have been identified and mapped. We have also located genes responsible for resistance to plant diseases, including Maize Dwarf Mosaic Virus, and now are breeding disease resistance into commercial corn varieties. Once pesticidal toxin genes are successfully expressed in a plant, these tools allow breeders to rapidly develop breeding populations that carry both pest resistance and exceptional yield performance. Planting seeds carrying these

traits will reduce farm labor and pesticide expenditures, allowing both our company and the farmer to capture the economic value our technology adds.

In summary, the products that I have discussed, when combined with systems of organic farming, IPM and low-input sustainable agriculture all offer methods by which growers can effectively reduce the use of conventional pesticides, thereby lowering residues in foods. Although chemical pesticides will be needed well into the next century, both traditional chemical companies and biotech firms are committed to finding alternatives to replace noxious products and to safely and effectively control chemical-resistant pests. A wide array of new products have been developed; many have been tested in the field. Most are stalled within EPA awaiting registration. The prolonged delay before commercialization troubles farmers and companies alike. While we await EPA approval of our products, farmers, and consequently the public, are denied an array of effective alternatives. Congress needs to realign EPA's priorities to assure that farmers will have available new pesticides when they lose chemicals denied registration or re-registration due to food safety concerns. In addition to EPA's effort, we believe that more coordination is needed between EPA and the USDA Cooperative Extension Service, which has often been the primary source of information on synthetic chemical pesticides, their proper handling and usage. These same channels of communication can impart information about the potential advantages of using biological pesticides and the proper application necessary to ensure productive results.

Mr. Chairman, I believe that over the last five years Mycogen and others have demonstrated that economically viable biopesticides can and have been commercialized and are being used successfully by farmers. The growing field of biotechnology will in the future provide even better answers to the chemical and food safety issue. I also believe that with greater public commitment to acceptance of biopesticides, these products will be available without delay. My responsibility and that of others in the biopesticides industry is to provide the products that allow growers to adopt these reduced risk measures without loss of profits. Growers need biopesticides and other naturally-derived alternatives and they need them quickly. Attention must be focused on registering these products expeditiously. If Congress and this Administration make a commitment to expedited approval and grower education for reduced risk pesticides, research and development will intensify and both new and old companies will bring alternatives to the market.

Mr. TOWNS. Mr. Knutzon.

STATEMENT OF JIM KNUTZON, SENIOR VICE PRESIDENT, OPERATIONS, SCIENTIFIC CERTIFICATION SYSTEMS, INC.

Mr. KNUTZON. My name is Jim Knutzon, I am senior vice president of Scientific Certification Systems. Thank you for the opportunity to present testimony today on the topic of agricultural products produced by alternative means at affordable prices.

To give you a better perspective on my comments, I would like first to briefly explain my own agricultural background. I have had the unusual opportunity to experience nearly every aspect of agriculture and food distribution. I began my career as an agricultural chemical salesman. Later, I was made general manager of a large-scale conventional vegetable production operation, where I used all of my chemical knowledge.

Next, I became co-founder of an organic vegetable operation. This company transitioned all of its production into organic products, the great majority of which were marketed to conventional supermarkets. The company was able to succeed by producing quality products at reasonable prices without the use of chemicals.

After selling my interest in this company in 1989, I became senior vice president of operations for Scientific Certification Systems. This company's NutriClean program certifies growers' crops to a "No Detected Residue" standard, and in addition, works with retailers to test their produce.

Together, this work experience has given me a unique perspective on the questions this committee has raised. And speaking from this perspective, I feel it is not only necessary, but entirely possible to provide an affordable, clean food supply.

Can agricultural products that were grown without chemicals or with fewer chemicals be sold at affordable prices? In order for any agriculture producer to sell products in a competitive market, that produce must have sufficient yields and qualities comparable to or greater than the majority of competing products. Producers who have participated in the NutriClean "No Detected Residue" Certification Program for any length of time have learned what alternative pest control measures must be integrated into their farming practices in order to produce the yields and qualities to consistently deliver products at market or near market prices.

These producers have altered their farming practices in many different ways. Some have chosen to grow their crops organically, while others have either changed the chemicals they used, altered the timing of applications, or reduced or eliminated certain pesticides altogether. A variety of integrated pest management techniques have been employed, ranging from the release of beneficial insects to variations in crop rotations. Each producer's situation is unique in terms of crop and growing location; as a result, no one prescription is useful. We rely on the ingenuity of the American farmer to decide which agricultural practices can produce products meeting the "No Detected Residue" standard while meeting the quality standards of the consumer.

Over the years, we were successfully certified just about every kind of produce item, from lettuce and potatoes to strawberries and grapes. The supermarkets, competing on small margins in a highly

competitive industry, depend on their produce department to draw customers, and simply cannot afford to sell produce at exorbitant prices or to sell inferior quality.

What is the role of the marketplace in supporting changes in pesticide use?

When growers see a competitive advantage by changing their pesticide practices, they will develop systems that meet high standards. This competitive advantage may simply be satisfying the requests of their retail grocery customers. Another incentive may be access to new retailers that have previously not been approachable. In addition, small premiums paid for organic or "No Detected Residue" food encourages such practices. These market incentives have successfully encouraged farmers to change their practices. There are far more resources in the private sector than there will ever be in the public sector to guide the transition to a safer food system.

There are other reasons why the marketplace must stay actively involved. For one thing, our food system extends far beyond the borders of this country. Our supermarkets now carry many produce items year-round that once were only available on a seasonal basis. Imports from Mexico, Central and South America, New Zealand, and Europe have become mainstays of the America diet. In some of these countries, pesticide laws are more lax than they are here, and pesticides not permitted to be used in the United States may nevertheless find their way into U.S. supermarkets. There is only so much that the Government can do to monitor food at the border. Just a tiny fraction of imported food is tested, and even when illegal residues are found, the food has often already reached the store shelf.

But borders have no bearing on certification. Food meeting "No Detected Residue" standards can be grown anywhere, if the incentive is there to do so. The NutriClean program has been to Central America in search of certifiable bananas, to Chile in search of certifiable grapes, and to Mexico in search of all kinds of fruits and vegetables. We have been able to help growers in these countries adapt their farming practices to meet certification standards in order to satisfy the marketplace demand.

What steps can the Government take to encourage this transition?

Government has an important place in helping define marketplace incentives to reduce pesticide usage. First, Government can legitimize the claim of "No Detected Residues" by defining a standard for this claim. Government recognition would go a long way toward sending a message to growers and supermarkets that private initiative is welcome and will be supported. This recognition would also ensure that consumers are more award of their options.

In addition, Government is the appropriate watchdog to monitor the marketplace claims of organic and "No Detected Residue" food. Actions in this area might include establishing accreditation procedures for certification programs and monitoring retail claims to make sure that consumers are getting accurate information about the products they are purchasing.

The National Academy of Sciences and the report released concurrently by the Environmental Working Group have broken new ground in focusing attention on the risks of pesticides to infants

and children. What these studies are saying, in the end, is that while it will remain difficult for scientists to pinpoint the exact dangers associated with pesticides in food, it is nevertheless possible to take strong action now to minimize these dangers to ourselves and to our next generation, without sacrificing the health and vitality of our agricultural economy.

Mr. TOWNS. Thank you.

[The prepared statement of Mr. Knutzon follows:]

Working with Marketplace Forces to Encourage Pesticide Reduction

Testimony presented to
the Human Resources and Intergovernmental Relations Subcommittee
of the House Government Operation Committee

Jim Knutzon
Senior Vice President, Operations
Scientific Certification Systems, Inc.

Thank you for the opportunity to present testimony today on the topic of agricultural products produced by alternative means at affordable prices.

To give you a better perspective on my comments, I would like first to explain briefly my own agricultural background. I have had the unusual opportunity to experience nearly every aspect of agriculture and food distribution. I began my career as an agricultural chemical salesman. Later, I was made general manager of a large scale conventional vegetable production operation, where I used all my knowledge of agricultural chemicals. Next, I became co-founder of an organic vegetable operation. This company transitioned all of its production into organic products, the great majority of which were marketed to conventional supermarkets. The company was able to succeed by producing quality products at reasonable prices without the use of chemicals. After selling my interest in the company in 1989, I became Senior Vice President of Operations for Scientific Certification Systems. This company's NutriClean program certifies growers' crops to a "No Detected Residue" (NDR) standard, and in addition, works with retailers to test their produce.

Together, these work experiences have given me a unique perspective on the questions this committee has raised. And speaking from this perspective, I feel it is not only necessary, but entirely possible to provide an affordable clean food supply.

Can agricultural products that were grown without chemicals or fewer chemicals be sold at affordable prices?

In order for any agricultural producer to sell products in a competitive market, that produce must have sufficient yields and qualities comparable to or greater than the majority of competing products. Producers who have participated in the NutriClean "No Detected Residue" Certification Program for any length of time have learned what alternative pest control measures must be integrated into their farming practices in order to produce the yields and qualities to consistently deliver product at market or near market prices.

These producers have altered their farming practices in many different ways. Some have chosen to grow their crops organically, while others have

either changed the chemicals they used, altered the timing of applications, or reduced or eliminated certain pesticides altogether. A variety of integrated pest management techniques have been employed, ranging from the release beneficial insect releases to variations in crop rotation. Each producer's situation is unique in terms of crop and growing location; as a result, no one prescription is useful. We rely on the ingenuity of the American farmer to decide which agricultural practices can produce products meeting a no detected residue standard while meeting the quality standards of the consumer.

· Over the years, we have successfully certified just about every kind of produce item, from lettuce and potatoes to strawberries and grapes. The supermarkets, competing on small margins and in a highly competitive industry, depend on their produce department to draw customers, and simply cannot afford to sell produce at exorbitant prices or to sell inferior quality.

What is the role of the marketplace in supporting changes in pesticide use?

When growers see a competitive advantage by changing their pesticide practices, they will develop systems that meet high standards. This competitive advantage may simply be satisfying the requests of their retail grocery customers. Another incentive may be access to new retailers that have previously not been approachable. In addition, small premiums paid for organic or No Detected Residue food encourages such practices. These market incentives have successfully encouraged farmers to change their practices. There are far more resources in the private sector than there will ever be in the public sector to guide the transition to a safer food system.

There are other reasons why the marketplace must stay actively involved, too. For one thing, our food system extends far beyond the borders of this country. Our supermarkets now carry many produce items year-round that were once available only on a seasonable basis. Imports from Mexico, Central and South America, New Zealand, and Europe have become mainstays of the American diet. In some of these countries, pesticide laws are more lax than they are here, and pesticides not permitted to be used in the U.S. may nevertheless find their way into U.S. supermarkets. There is only so much that the government can do to monitor food at the border. Just a tiny fraction of imported food is tested, and even when illegal residues are found, the food has often already reached the store shelf.

But borders have no bearing on certification. Food meeting "no detected residue" standards can be grown anywhere, if the incentive is there to do so. The NutriClean program has been to central America in search of certifiable bananas, to Chile in search of certifiable grapes, and to Mexico in search of all kinds of fruits and vegetables. We've been able to help growers in these countries adapt their farming practices to meet certification standards, in order to satisfy the marketplace demand .

What steps can government take to encourage this transition?

Government has an important place in helping define marketplace incentives to reduce pesticide usage. First, government can legitimize the claim of "no detected residues" by defining a standard for this claim (at a detection limit of 0.05 ppm). Government recognition would go a long way to sending a message to growers and supermarkets that private initiative is welcome and will be supported. This recognition would also ensure that consumers are more aware of their options.

In addition, government is the appropriate watchdog to monitor the marketplace claims of organic and no detected residue food. Actions in this area might include establishing accreditation procedures for certification programs, and monitoring retail claims to make sure that consumers are getting accurate information about the products they are purchasing.

The National Academy of Sciences (NAS) study and the report released concurrently by the Environmental Working Group have broken new ground in focusing attention on the risks of pesticides to infants and children. What these studies are saying, in the end, is that while it will remain difficult for scientists to pinpoint the exact dangers associated with pesticides in food, it is nevertheless possible to take strong action now to minimize these dangers to ourselves and to the next generation, without sacrificing the health and vitality of our agricultural economy.

Jim Knutzon

Senior Vice President, Operations
Scientific Certification Systems

B.S., Business Administration, University of Iowa, 1972.

Mr. Knutzon joined Scientific Certification Systems as Senior Vice President of Operations in 1989. He has extensive experience in both manufacturing plant operations and agriculture.

Mr. Knutzon served as the Supervisor of Administration, and later as Plant Manager, for White Chemical Co., a pesticide manufacturing firm and division of Shell Oil. In this capacity, he oversaw the formulation, distribution, and use of many agricultural chemicals. After gaining experience in the production of pesticides, he became a California licensed Pest Control Adviser, providing extensive pest management consultation to farmers. After relocating to Colorado and managing a branch facility of the Arizona Agrichemical Company, he turned to full-time farming. He managed an extensive iceberg lettuce operation, and eventually founded Valley Fresh Distributing where he expanded into a broad variety of vegetable crops, including carrots, spinach, lettuce, potatoes and broccoli. Under his direction, Valley Fresh became the largest distributor of organic carrots in the U.S.

These unique experiences have given him an intimate knowledge of the environmental consequences of food production and the need for workable solutions. Mr. Knutzon has become a recognized expert in the fields of applied integrated pest management and alternative agricultural production. He was instrumental in establishing organic standards and legislation for the State of Colorado, and currently oversees operations of SCS's NutriClean agricultural testing and certification division.

With respect to SCS's environmental programs, Mr. Knutzon helped to develop the technical backbone of SCS's certification standards and auditing procedures for recycled content of paper, steel, glass and plastics, and for other environmental claims. He also helped to create SCS's Forest Conservation Program. Mr. Knutzon has represented SCS before numerous governmental and industry panels evaluating current green marketing issues.

Products Which Have Been Certified to Meet NutriClean "No Detected Residue" Standards

Apples
Apple Juice
Apricots
Artichokes
Asian Pears
Asparagus
Avocados
Bell Peppers
- Green
- Red
Bok Choy
Broccoflower
Broccoli
Cabbage
Carrots
Cauliflower
Celery
Chili Peppers
Corn
- Yellow
- White
Cotton
Cucumbers
Currants, Red
Dates
Endive
Escarole
Garlic
Grapefruit
Grapes
Green Beans
Kale
Kiwi Fruit
Leek
Lemons
Lettuce
- Butter
- Green Leaf
- Iceberg
- Organic Mixed
- Red Leaf
- Romaine
Melons
- Cantaloupe
- Casaba
- Honeydew
- Watermelon
- Sharlyn
Mushrooms
Nectarines
Onions
- Green
- Red
- White
- Walla Walla
- Yellow
Oranges
Peaches
Pears
Persimmons
Pomegranates
Potatoes
- Red
- Russet
- White
- Yellow
Radicchio
Raspberries
Spinach
Squash
- Banana
- Pumpkin
- Summer
- Winter
- Zucchini
Strawberries
Sweet Potatoes
Tangerines
Walnuts
Yams

Examples of Companies Which Have Had Products Certified to Meet "No Detected Residue" Standards

A. Levy & J. Zentner
A.T.B. Packing
A.V. Thomas
Accito Farms
Alkop Farms
Anthony Farms
Anton Caraton & Son
Arlie Roger
Benson Farms
Bos Green House
Cal Choke
Cal Farms
Cal Fruit
Cal Organic Farms
Calcagno Farms
Calcagno Farms
Cy Mouradick & Sons
Dave Theodore
Desert Diamond Sales
Doreva
Drazil Rajnus Farms
Dwelley Farms
Dynasty Farms
El Rancho Farms
Elliot & Sons
Estrada Produce
Five Crowns Marketing
Fordel Farms
Gary Pitts
George Perry & Son
Giba/Wheeler Farms
Golden Acres Farms
Green Acre Farms
H. Smith Packing
Hamilton Farms
Houk Farms
Jack Martin Farms
Joe Marchestotti
Jungle King Distributing
Keber Distributing
Kern Ridge Growers
Kirk Produce
Krawcaw Produce
Kresa Ranch
Landmark Produce
Lindemann Produce
Loma Vista Farms & Anthony Farms
Mendelson-Zeller/ Aljoba Research
MGA Co-op
Mike Yurosek & Son, Inc.
Mission Produce
Monarch Land Co.
Mt. Valley Farms
Munger Farms
Nalbandian Sales
Nevada Potato
Oasis Distributing
Ocean Organics
Osumi Farms
Pacific Fresh
Paul Carota
Pieri & sons
Prescott Farms
R.A. Rassmussen & Sons
Rancho del Rio Rey
Rancho Packing
Ray Arreola Farms
Riverview Investment
Royal Orchards
Seal Beach Ranch
Searingen/Moore
Sierra Produce
Siri & Son
Skyline Ducor Ranch
Stamoules
Stephen Pavich & Sons
Sunrise Farms
Tanimura & Antle
Taylor Maid Farms
Valley Fresh
Valley Pride Sales
Victoria Island Farms
Walla Walla Sweets & Gloria
Washington Lettuce
Well Pict
Wheeler Farms

B METRO
STATE

Can You Tell Which Carrot Has The Unacceptable Level Of Pesticides?

No, you can't tell. Not just by looking.

But if you shop at Raley's or Bel Air, you can shop with trust, because only our stores test produce like we do. And offer produce *certified to meet the highest standards on earth.*

First, and most important to parents and pregnant women, we offer NutriClean Certified Produce. To receive NutriClean certification, produce is tested to a strict standard (0.05 parts per million). There must be "no detected residues". None. Period.

Second, we methodically and randomly test produce that arrives at our warehouses. This testing further helps us identify growers who are working to reduce or eliminate pesticide residues.

Rest Assured It's NutriClean

We didn't react. We anticipated... 7 years ago.

You see it on TV, you hear it on the radio, you read it in the paper. Concern about pesticide residues on food is growing.

A dozen concerned groups from the PTA to the California Medical Association have demanded "no detected residue" in stores and restaurants.

Raley's listened - seven years ago! That's how long Nutriclean Certified Produce "no detected residue" produce has been available on our shelves.

You don't have to wait or be rich to enjoy healthy produce.

Because of our testing and the availability of Nutriclean Certified produce at low prices, you don't have to wait until regulations or farming practices change.

The clean healthy produce your family deserves is available now.

It was there seven years ago. It will be there seven years from now. And you can trust our stores to constantly strive to attain the best in quality, in freshness, in taste - and most important of all - in health for you and your family.

Thanks for your trust. In return, we promise to continue to earn it.

Raley's
and
Bel Air

Gary
Gerould

Raley's and Bel Air have the Toughest Pesticide Residue Standards in the Industry

You can buy our fresh fruits and vegetables at Raley's and Bel Air with the confidence that you're serving your family the highest quality, most wholesome produce sold in supermarkets."

Every year in America, millions of pounds of pesticides are sprayed on the fruits and vegetables we eat.

However, only about 1% of this produce is tested by the government to be sure it meets legal standards for pesticide residues.

The National Academy of Sciences (NAS) has reported that many of these pesticides may pose dietary health risks. The EPA has also expressed concern about the possible health risks caused by pesticide residues.

New Pesticide Residue Study

On a recent TV broadcast of "Frontline", Bill Movers reported that a new study from the National Academy of Sciences will be released sometime this summer. Movers said the study will reveal that current legal levels for pesticide residues are too high to protect children from possible health risks.

This study will likely say that because of children's higher exposure (per unit of body weight) and developing organ systems they are at higher risk from current legal pesticide tolerances. This is mostly the result of children's higher-than-adult consumption rates on many fresh fruits and vegetables.

We're Monitoring Pesticide Residues

Today, while there is still much controversy about pesticide issues, we are happy to report that many of our growers are making a serious effort to reduce pesticide usage. We commend them.

We do not know who is right or wrong on the pesticide issue, but we feel there is enough evidence of potential health risk that we have taken steps to provide an extra level of protection for you and your family.

We have two programs to monitor pesticide residues on our produce.

Weekly Lab Testing

Every week, random samples of our fresh produce are sent to independent labs for pesticide residue analysis. Samples include both domestic and imported fruits and vegetables. This testing helps us identify growers who are using fewer pesticides on their crops.

Through our scientists at Nutri Clean, data is also used to assist other growers who are trying to reduce pesticide residues.

We are pleased to report that we have joined two other large west coast food retailers to share all of the lab test results. This data monitored by food scientists, provides a huge pool of information used to improve the quality of the fruits and vegetables available to our customers.

No Detected Pesticide Residues

Our Nutri Clean Certified produce is grown under the supervision of Nutri Clean food scientists who work in cooperation with growers. When you see a Nutri Clean Certified sign on a produce item at Raley's or Bel Air, it means the item has *no detected pesticide residues.**

We are proud to say Nutri Clean Certified standards for wholesomeness are the toughest ever introduced by government or the supermarket industry.

We invite you to shop for produce at Raley's or Bel Air. You can buy with the confidence that nobody is working harder to bring you clean, wholesome, high-quality fresh fruits and vegetables.

*Limit of detection is 0.05 ppm for most pesticides

Raley's and BEL AIR

Delicious, fresh produce!

FRESHNESS GUARANTEE
PRODUCE
MEAT / FISH
DOUBLE YOUR MONEY BACK
BAKERY
DAIRY
DELI

Fruits and vegetables so FRESH...

They're backed by our DOUBLE Your Money Back Guarantee. That's how confident we are of the freshness and quality of our produce.

Seedless Grapes

Green Thompson or Ruby Red seedless grapes. A sweet, refreshing snack.

88¢ Lb.

"You get NutriClean Certified produce with no detected pesticide residues."

Through NutriClean, an independent testing service, we work with growers to reduce pesticide use in the fields. And here are just a few of the NutriClean items you'll find at low prices at Fred Meyer this week.

Head Produce Buyer

- ☑ Cauliflower
- ☑ Butter Lettuce
- ☑ Red Leaf Lettuce
- ☑ Head Lettuce
- ☑ Gr. Leaf Lettuce
- ☑ Broccoli
- ☑ Broccoflower
- ☑ Yams
- ☑ Sweet Potatoes
- ☑ Kiwi Fruit
- ☑ Cabbage
- ☑ Avocados
- ☑ Green Onions

Ralphs Puts Its Produce to the Test!
PRODUCE
LABORATORY TESTED
NUTRI CLEAN
To Help Protect Your Family from Pesticide Residues!
Our goal is to offer our customers fresh fruits and vegetables with minimum levels of detected pesticide residues.
Random samples of selected products are tested by NUTRI CLEAN, an independent scientific certification company.
These samples are taken from our warehouse and sent to an independent laboratory for pesticide residue testing and analysis.
Certified--No Detected Pesticide Residues!
Additionally, Ralphs will offer fresh fruits and vegetables which will be Certified by NUTRI CLEAN to contain No Detected Pesticide Residues.
Here's how NUTRI CLEAN Certification works:
Scientists inspect the growing fields for signs of chemical use and take representative samples--which are then laboratory tested. To qualify for the NUTRI CLEAN Certification seal of approval, the product must contain No Detected Pesticide Residues.
Ralphs Promise To You!
We'll always do our best to offer our customers High Quality and Wholesome Fresh fruits and vegetables.
Ralphs

De FRANCESCO

BROTHERS RANCH

Firebaugh, California

ALMAR BRAND

ASPARAGUS

Grown, packed & shipped with care.
Come to the westside for premium asparagus.

Sales: 209-364-6438 • FAX: 209-364-6383

PRODUCE LABORATORY TESTED
NUTRI CLEAN
Certified
Contains No Detected Pesticide Residues!

Phil Hartman
Mario DeFrancesco III

ISSUES IN
FOOD SAFETY

October 1990 Vol. 2 Issue 3

Retailer's Perspective

RALPHS: COMMERCIAL TESTING FOR CONSUMER CONFIDENCE

In this edition, **Issues in Food Safety** *introduces a new column dedicated to providing firsthand the retailer's experience and actions in dealing with consumers and employees on the issue of food safety. Our first "Retailer's Perspective" article explores the decision by Ralphs Grocery Company to implement a commercial testing program for its fresh produce. Our article relays Ralphs' story as told to Karen Boverlin at the Fresh Produce Council.*

"As problems have arisen Ralphs has certainly been well positioned," stated Kerry Hodges, vice president of produce marketing for Ralphs Grocery Company, Los Angeles, Calif., when discussing the atmosphere surrounding today's produce industry.

To what does the Ralphs executive attribute this comfortable attitude? According to Hodges, the successful implementation of commercial testing program through NutriClean, a non-government certification service, is responsible for his point of view. He believes that the contract with NutriClean has allowed the chain to offer its customers an added level of assurance regarding the quality of its fresh produce. Hodges said it enabled Ralphs to maintain a high visibility during recent episodes which created increased consumer awareness about the safety of fresh produce.

Hodges said Ralphs' stance on this issue has been well received by its customers.

"Consumer response has been overwhelmingly positive," he said. "Ralphs has acted very responsibly, and made no wild claims."

NutriClean offers Ralphs and its shoppers two programs: Dock Testing and Certification. The Dock Testing program is designed to supply retailers with information regarding residue levels of pesticides (1) with a history of high residue levels, (2) under special review, or (3) not routinely screened by the California Department of Food and Agriculture (CDFA) or the United States Department of Agriculture. Random samples of fruits and vegetables chosen by NutriClean and/or Ralphs are taken weekly and tested to determine compliance with state and federal standards. The results are shared with all the stores under contract with NutriClean.

Under the Certification program NutriClean acts as an auditor, monitoring certain produce items in the field. Growers who contract with the firm

Continued on Page 6

COMMERCIAL TESTING
Continued

must fully disclose all pesticides used. Representative samples are taken and tested for each disclosed chemical. Only those fruits and vegetables that are found to contain no detected residues (test to .05 parts per million) are marketed with the NutriClean Certified seal.

Both programs are designed to furnish a retailer with data which can be used in making decisions. Participating retailers are able to identify those growers who consistently produce the cleanest fruits and vegetables by NutriClean standards.

The Certification program is a method of "providing a standard for achievement for growers," said Linda Brown, director of corporate communications, NutriClean, Oakland, Calif. "One of our goals is to develop positive incentives for growers to produce fruits and vegetables with the cleanest standards."

"The feedback loop is essential," Brown said. Growers and retailers can use the information to make modifications in cultural and buying practices.

"We have no interest in competing with the government," declared Brown. "The government is doing a great job, but to put the onus of all quality control on the government is to expect the moon.

"Other industries have quality control built into the industry," she continued. "This is a quality control issue more than a food safety issue."

Hodges notes that two types of NutriClean signs are used by Ralphs. Signs are located in the produce department listing the items included in the dock testing program, and signs identifying items certified by NutriClean to be free of detectable residues are posted above the fruits and vegetables that fall into this category. In addition, brochures explaining Ralphs NutriClean program are available to consumers. Separate signage is used for certified organic produce items.

If NutriClean discovers, through the dock testing program, produce items that contain violative residues, the CDFA and U.S. Food and Drug Administration are notified. If NutriClean finds residue amounts close to violative levels, the appropriate label is monitored more closely to ensure compliance.

The use of independent testing by retailers or anyone involved in the marketing channel may continue to generate sparks within the industry, but Hodges sees the contract with NutriClean as a logical step in Ralphs quest to provide an added level of assurance to its customers.

"The industry as a whole has weathered this challenging period well," said Hodges. "The industry will continue to make the changes that are necessary and will be stronger for it."

Success Isn't Automatic

Maine grower Greg Smith says sophisticated machinery can help productivity — but good business decisions boost the bottom line.

By Jean D. Aylsworth
Staff Writer

GREG SMITH has invested in some sophisticated new equipment lately to improve efficiency in the field and the packing shed at H. Smith Packing, Blaine, ME.

But he's quick to point out that all the bells and whistles won't ensure an operation's success. The main keys to making it in the vegetable business, he says, are good management, highly qualified staff you can depend on, and luck — not necessarily in that order.

"We have some good people here who make a major difference in the operation," Smith says. "My cousin, Lance Smith, heads up broccoli production, and my brother-in-law, Andy Yeager, is sales manager for potatoes. I couldn't do the job without them.

"Teamwork is an important part of all our management decisions — including the one to buy the new equipment."

Flexible Harvesting

Smith added a second large field pack unit for broccoli in response to greater market demand. It's a wrap-around-type harvester from Salinas Valley Engineering that can accommodate a crew of 36 — including those on the ground.

The two large harvesters have the capability for volume, while a smaller harvester adds flexibility. Since it can be moved more easily from field to field, the smaller unit can be used to fill in as needed. With the three units combined, Smith's harvest crews can cut and pack a whopping 4500 cartons of broccoli in a single day.

Keep in mind that in northern Maine, daylight in the summer can last from 3:30 a.m. to 9:00 p.m. — so workers may be in the field 12 to 13 hours a day during the peak season.

Also, Smith has increased the capacity of his harvest equipment by adding conveyors — another management decision.

Quality On Ice

Once cartons are moved from the field to the packing shed, they are cooled immediately with slush ice injected with equipment from Post-Harvest Technology. Cartons are then loaded onto trucks or put into the cooler. Most are delivered to markets throughout the Northeast the same day or the following day.

"We take pride in the freshness of our product," Smith says. "We deliver a fresher product to our customers, who can then provide a better product for the consumer.

"And everything in this business comes down to the consumer. We want to do whatever we can to provide the kind of product the consumer wants to buy."

Tracking Consumers' Needs

Smith says it sometimes seems as if each customer is looking for a slightly different product.

"Some want short cuts and others are asking for longer cuts," he says. "With changes in eating habits and patterns of living, consumers are spending less time in the kitchen. Many are looking for pre-cut, easy-to-prepare products. We have to keep abreast of what consumers want and be willing to meet those needs.

"As growers, we sometimes become too production-oriented. But the whole broccoli industry is changing. To stay competitive, we have to become more consumer-oriented."

Being in tune with consumer concerns is one reason Smith Packing decided to work with Nutriclean, a pesticide residue testing laboratory.

"We scout the fields every week and are careful to apply pesticides only prior to head formation," Smith says. "That knocks the insects back and keeps the residue level well below the threshold. When our product is tested for residues, there's been no evidence of any problem."

Since some of Smith's customers like having the reassurance of private laboratory testing, it becomes a marketing tool.

Sticking With Broccoli

While broccoli consumption has gone up dramatically in recent years — thanks in part to evidence that fresh produce is essential to a healthy diet — competition has also increased as more and more growers have decided to give broccoli a try.

In fact, Smith Packing jumped on the broccoli bandwagon in 1984 rather than stake its future solely on its mainstay crops of potatoes and grains.

"We wanted to diversify our operation, and with increasing market demand for broccoli it looked like a good crop for us," Smith says.

Since then, acreage has increased steadily to about 1400 acres — although it is leveling off. Rather than increase acreage any further, Smith says he'd rather concentrate on squeezing more production out of his existing fields.

"The average yield is about 300 cartons per acre, but we've been able to raise that by 50 to 100 cartons per acre," he says. "In some fields we're getting 600 to 700 cartons per acre."

Private Field Trials

One of the ways that yield has been achieved is through extensive testing of new cultivars and selection based on performance.

"What works in California won't necessarily work here because of our different growing conditions," Smith says. "Since we have just 3½ months to grow, we have to make the most of that time."

Every year, Smith puts in a test plot on the farm in conjunction with Johnny Select Seeds of Albion, ME. Typically, more than 100 cultivars are planted and evaluated carefully by Lance Smith and his associate, Pete Pierce. They look for cultivars with overall good appearance including uniform, dome-shaped heads, good color and stem size, and vigor.

One of the most important considerations is resistance to head rot — a condition that can wipe out a broccoli field almost overnight.

"Head rot is a real concern to us because our humidity can get to 80%-90% sometimes during the growing season," Greg Smith says. "Once it gets started in a field, we can lose a lot real fast."

Cultivars that perform well the first time around are given a second look the following season.

"In the second phase, we plant 5 to 10 acres of a cultivar and determine where it fits in best with our production schedule," Smith says. "If it's an earlier cultivar, we look for resistance to cold. In a later cultivar, drought resistance is important."

Always Looking

With success in broccoli under his belt, it's not surprising that Smith would be interested in taking a look at other vegetable crops. He's tried several kinds of lettuce and cauliflower with mixed results.

"Our season is short and we can only do so much well," he says. "Some things can suffer if we spread ourselves too thin. We're always looking at other crops, but it's been a management decision to get back to basics and concentrate our efforts on becoming more efficient at what we know we can do." □

Cost Savings Are No Small Potatoes

Since Maine is a major potato-producing state, it was only natural that Herschel Smith — H. Smith Packing's founder, now semi-retired — would choose potatoes as his top crop. Even today the farm produces 1100 acres of potatoes annually, mostly round whites and russets.

But now there's a more high-tech approach. Greg Smith, Herschel's son, recently added computerized bagging and weighing equipment in the potato packing sheds. He says the equipment has been "a real shot in the arm" — improving efficiency and profitability substantially.

"These machines have allowed us to increase our productivity and accuracy," he says. "Our bags used to be as much as ½-pound overweight. With 10,000 5-pound bags per load, we were giving away about 5000 pounds of potatoes every time a truck pulled out. Now we can pack bags that vary by no more than ¼ to ½ ounce each.

"With that kind of savings, the equipment pays for itself in a hurry."

THE GROWER

PUBLICATION OCTOBER 1991

The farmer's eye

By Kelly Barton

Old-fashioned ways and ingenuity have pushed Tanimura & Antle to the forefront of the produce industry.

Photos by Kelly Barton

Innovation.

It's something Tanimura & Antle has relied on to make it a leader in the fresh produce industry. The Salinas, Calif.-based company has tried some pretty imaginative moves—from a vacuum to suck up pests to a below-ground drip irrigation system to a custom computer program that dispenses pesticide advice like a doctor diagnosing patients. But despite all the high-tech equipment the 9-year-old company has available, all decisions come back to one thing—the farmer's eye.

"The farmer's word is the last word," said Steve Bassi, the company's production manager of growing operations. "We depend on his experience and knowledge to make any final decisions."

That simple philosophy has helped make the young company the largest independent lettuce grower in the United States. T&A also grows celery, cauliflower, green onions, broccoflower and broccoli on more than 20,000 acres in Salinas, Huron and Oxnard, Calif., Yuma, Ariz. and Ciudad Obregon, Mexico.

Beginnings

Though only formed in 1982, the company's principals, Bob Antle and George, Charles, John, Robert and Tom Tanimura, have long been leaders in the produce industry.

The company has been successful, Bassi said, because T&A caters to its customers. "Whatever the customer wants, we try to do," he said.

That customer could be the retail buyer or the supermarket shopper, said Rick Antle, Bob's son and now president of the company. "The thing this company does better than other companies is matching customers to their needs," he said. "We are not farm driven. We can't push a button and see what the customer wants. Consumer demand precipitates what we do."

Perhaps the biggest directive the supermarket shopper has handed to growers was the desire for less pesticide use. That sent T&A scurrying in different directions to find the best ways to reduce chemical use.

The most publicized method it

TKA's headquarters in Salinas (far left). TKA has five harvesters of workers. These workers still make between $24,000 and $30,000 a year. Most of the company's field supervisors once were cutting produce in the field (left). One of TKA's 30 greenhouses.

Salad Vac, the post-harvest called the Salad Vac, did not prove to be as successful as hoped. But it has been helpful in making them at light-weight, reusable totes at some markets, which has helped reduce chemical use. The company also has stepped heavily in biological controls and has experimented with applying beneficial insects from an airplane.

TKA markets some of its produce as "residue-free" after undergoing tests by NutriClean. Shoppers at TKA produce that has passed residue-free given the NutriClean label. Likewise produce that has been harvested with the Salad Vac also has that information on resealable wrappers.

"We would be failing our customers if we didn't use some traditional chemicals, because we absolutely need them to grow the best produce we can," Rick Antle said. "It isn't feasible to not use any chemicals, but we can give our customers products that has a detectable residues."

TKA also does everything it can to keep retail buyers happy with its product. "We have store owners and buyers come through our operations so we can watch their reactions," Rick Antle said. "This guides us in the right direction.

The retailers environmental concerns have precipitated the company's desire to quit using wax cartons. Only green cartons, broccoli and celery are packed in the boxes now so they can stand up to ice.

Other packaging feats the company claims include shipping sweet tomatoes vetiver to increase freshness and shelf life, shipping salad pallets on wire with a poly liner to reduce carton chafing and dehydration and shipping Zen-pack to cure on racks for improved moisture air flows and product service.

Fulfilling the market

Constant demand encourages the growing company to harvest across California and Arizona. Its new fungo into Mexico has helped make it possible to harvest all year long.

TKA also increased its product mix and started a niche market by introducing broccoflower to U.S. consumers. Incorrectly touted as a broccoli-cauliflower cross, Rick Antle said the variety is a green cauliflower. He got the original seed from Holland, and TKA breeders increased the green color. Though broccoflower only has been available for three years, consumers have embraced the vegetable.

It has proven not to be competitive with broccoli or cauliflower. "Consumers are buying just as much broccoli and cauliflower as ever," Rick Antle said. "Initially it was seen as a novelty, but now con-

Continued on Page 18

Continued from page

systems are working closely with it. And they really like the result.

The fact that Transformer has more than 1,000 of these systems in service is evidence of customer satisfaction with the product. But there's also the reputation that a firm develops over time as a result of its continuing close relationship with customers.

Assuring quality

The growing reputation that is [illegible] has made it [illegible] quality because [illegible] from the ground floor.

If we can get your [illegible] a new company, we'll try to sell you. Furthermore, a [illegible] of that's our working principle. If it's not a good deal for you, it's not a deal.

Furthermore, our salesmen [illegible] to the company [illegible] after making a [illegible] sale. The salesman [illegible] the right [illegible] for the [illegible] work. Furthermore, that [illegible] is the best way we can ensure a [illegible] job. The [illegible] system [illegible] to [illegible] our customers [illegible] they really do.

[illegible] the [illegible] is the best way to [illegible] to the [illegible] The [illegible] a [illegible]

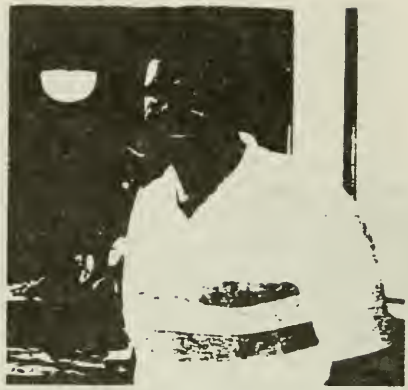
'The thing this company does better than other companies is matching customers to their needs.'

[illegible] a [illegible] to [illegible] the [illegible] [illegible] [illegible] The [illegible] to [illegible] [illegible] The [illegible] [illegible] [illegible]

region has not pressured other area growers to install the costly system. "We're seeing other good points from the drip," Bassi said. "Alleviating excess moisture on the surface of the beds allows reduced use of herbicides and fungicides. And we're achieving better insect control with less insecticides because we can apply chemicals whenever we want."

Drip irrigation also allows the company to use cover crops, a measure T&A takes seriously. "We're finding the soil structures are degrading," Bassi said. "Drip allows us to put in a short-season cover crop under circumstances where normally we couldn't." He estimated that 10 percent of the company's land was planted in cover crops.

Bassi said he believed good soil was one of the most important contributions to a quality crop. "If you rotate your land right, you'll keep your soil healthy," he said. "And that means a nice healthy crop." This makes insect and disease control a much simpler chore.



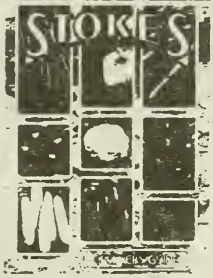
Rick Antle

"Consumers want less pesticides," Bassi said. "You can reduce chemical use greatly just by having a healthy crop on healthy soil."

"We have to take care of the land," Rick Antle added. It can be difficult to not allow the soil to rest occasionally, he said, especially when both renting and purchasing land is an expensive venture.

"But a farmer depends on the land," Rick Antle said. "And really, that's all we are." ■

CATALOG SHOWCASE



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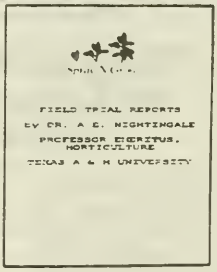

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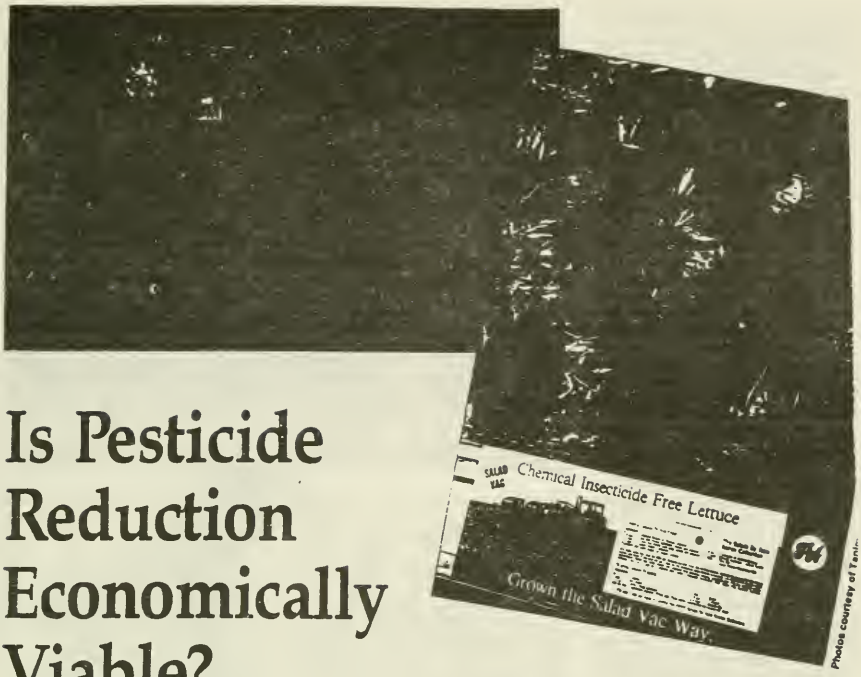

Photos courtesy of Tanimura & Antle

Is Pesticide Reduction Economically Viable?

Growers to retailers are heeding the call of rumbling concern for food safety by seeking alternative methods to using pesticides and making sure that product sold meets strict minimum-residue standards.

BY CHERYL PROVAL

Throughout the rich growing areas of of the U.S., many growers have embarked on a new and daring experiment. After years of farming with the miracle chemicals of the post-war era, growers are pulling back on the very pesticides that have helped them keep yields high and crop damage to a minimum.

Why are these growers risking their yields, their livelihoods and the future of their families?

There is no one answer, but fear looms at the top of the list. Fear of costly lawsuits from workers and casual passersby; fear that abiding by government pesticide standards is not enough and fear of another Alar-type scare.

Other pressing issues include the spiralling cost of pesticides, stiffening regulations and the simple fact that chemicals do not always work. But perhaps one of the most persuasive reasons growers are reducing pesticide use is that at the end of the food chain there is rumbling about food safety. And some supermarkets are heeding it.

Reading the Signs

There's no question that fear is a tremendous motivator when it comes to pesticide reduction, growers and executives with independent testing labs said.

"We have a lot of clients who are very nervous," said Robert Stovecik, president, Primus Group, an agricultural testing laboratory, Santa Maria, CA. "A lot of apple growers went out of business growing apples that were farmed in a legal manner.

"Anytime we apply any chemical, we open up our liability," said Stan Silva, president, Doreva Produce, Livingston, CA, a major sweet potato grower-shipper that also grows peaches and almonds. "If someone drives by and they see you spraying, suddenly they feel nauseous. The liability

...pesticides has also been ... in the past few years, so ... are definitely open to reducing pesticide applications where possible.

"With all the pressures on chemical companies, prices are going out of sight," said Dave Eldredge, vice president, marketing & sales, Tanimura & Antle, Inc., Salinas, CA.

"Pesticides are getting more and more expensive," said Gary Hamaguchi, president, Hamaguchi Almond Farm, Hilmar, CA. "More and more growers are saying, 'Is this really necessary?'"

And in selected instances, there simply are no pesticides to effectively curb the targeted pest. "When it comes to controlling white flies on hot house cucumbers, there's not a single chemical that works," said Ron Cline, general manager, Gourmet Gardens Produce, Standard, CA, a grower of hothouse cucumbers.

Many growers expressed discomfort with the role that the food safety issue has suddenly thrust upon them. In a comment that sums up the frustration of many growers around the nation, Silva said: "Up until the late '80s, chemicals were a part of our life. Now, we're the guys in the black hats."

"Pesticides wear a black hat, so anyone who is doing something to reduce that the customer looks favorably upon," says Charles Collings, Raleys.

Testing Plays Role

Independent testing labs, such as the Primus Group and NutriClean (Oakland, CA), that combine independent testing with a retail marketing program, are playing an important role in the reduction of pesticide use. Not only are these labs providing testing services, they are offering informed advice on measured pesticide applications as well as other information services.

The Primus Group provides growers and retailers with a higher comfort level in a climate of increasing uncertainty regarding pesticide use by testing and certifying that produce is within the tolerance levels set by the Environmental Protection Agency.

But in addition to testing the fields, the organization also acts as an information clearinghouse for breaking news on pesticides. As a pesticide comes under review by the EPA, Primus informs growers through its newsletter that tolerance levels may be revised.

"A lot of pesticides currently being used are going through a review process and so what we do is send out information and tell our growers that there is a review process underway on a particular pesticide," said Stovecik. "We use government tolerance levels (in our testing)."

Should a food scare arise, the Primus newsletter is a timely and reliable source of information, growers report. For instance, the recent findings on Aldicarb and bananas was reported in the newsletter.

"It was very impressive the way the International Banana Association took care of that," said Stovecik. "Rhone Poulenc found that when the compound Aldicarb is taken up from the soil, it is not distributed evenly throughout the fingers, which alarmed a lot of people, including themselves.

"The Association gathered a lot of regulatory people in Washington, D.C., and they came to some conclusions that addressed everyone's concerns. Rhone Poulenc voluntarily yanked the label and administered a lower tolerance level."

Disseminating information and testing crops are also important aspects of the NutriClean program. "It's information rich," said Linda Brown, vice president, communications, NutriClean. "We think the growers who have information are in the best position to make decisions. We help growers identify factors such as cultural practices, seed varieties and maturity of harvest."

NutriClean pioneered food testing back in 1984, and at the time, nutritional content was an important element of the testing process. "We were looking at both what was in food and what wasn't in food, in particular pesticide residues," said Brown. "We were looking at a method for rewarding growers' efforts to produce food at the cleanest possible levels."

Taking into consideration that government tolerance levels are set using the average body weight, NutriClean's "no detected pesticide levels" are more stringent than what the government allows.

Tolerances have been set with a lot of assumptions that don't necessarily relate back to an individual and his or her diet," noted Brown. For instance, a child's tolerance is lower than an adult's, a heavier person's is higher than a light person's, and some people consume far more produce than others, said Brown.

The NutriClean grower program involves a five-step certification program that sets in motion a chain of custody that goes beyond just taking a field sample and testing it, Brown said.

The steps include:

1) Full disclosure requirement. Growers disclose where, when and which pesticides were applied. "It's like bio-feedback," said Brown. "This is a feedback mechanism that shows them what is occurring in their fields, and we are able to show them how quickly a pesticide degrades. Over the years, we've acquired a lot of information on when and how to apply pesticides."

2) Field inspections. Representatives from NutriClean go into the field to visually map out how residues may concentrate. They look at neighboring fields to see if there may be a drift problem, and note any field depressions where water, and likewise pesticides, may concentrate.

3) Developing a sampling plan. Instead of testing an average sample from each field, NutriClean determines where a "worst-case" sample is best drawn.

"We might go to the periphery where they have double sprayed, or we might go into the packing shed," said Brown. "It's crop specific. The thing we don't do is automatically take our samples from the packing shed because that wouldn't tell us what the worst case scenario is."

4) Blind code testing. Samples are marked with a blind code that does not identify the

grower and tested by an independent lab with broad experience in food testing.

"This is critical," said Brown. "A lot of people have jumped into food testing and what we found was that many labs were water or soil testing labs. Food is much more complex than soil or water and each one has a different read-out."

3) Contractual chain of custody. A grower signs a contract in which he promises to deliver the food in the same condition that it was when certified.

According to Eric Engbeck, NutriClean certification accounts manager, grower participation in the program recently has surged. "The biggest growth we've had occurred in the past 14 months," said Engbeck. "We've jumped up quite a bit in the number of growers and fields per grower."

Engbeck said NutriClean has 180 to 200 grower and grower/shipper clients, and most certification takes place in California. However, the product being certified and the location of its growing fields varies seasonally, he said. Some certification takes place seasonally in Washington, Oregon and Arizona. Periodically, NutriClean certifies fields in Colorado, Idaho, Nevada, Arkansas and Maine.

"We felt there was a real concern about food safety and we thought we'd take a positive step to minimize the problem," said Tanumura & Antle's Eldredge, whose company participates in the NutriClean program. Tanumura & Antle invested heavily in a drip irrigation system that enables the company to apply pesticides in a reduced manner.

Several growers reported that demand has leveled for produce independently certified to be well within federal guidelines for pesticide residues. But many are making serious investments in reducing their pesticide use because they believe the food safety issue is a sleeping giant.

California Artichoke and Vegetable Growers, Castroville, CA, which produces a wide range of vegetables, including broccoli, cauliflower and artichokes, has participated in the NutriClean program since 1987.

"We started primarily because one of our customers requested it," said Pat Hopper, marketing director. "If it gives our customers an edge with the consumer, we're happy to do it."

Hopper sees no growing demand for the NutriClean produce. "However, we are not so naive to think that there's not another Alar situation down the road," she added. "We would like to be as far ahead as we can in protecting customers and ourselves."

According to Nathan Menninger, field foreman, A.V. Thomas Produce, a Livingston, CA-based grower of sweet potatoes, watermelon and almonds, he could not sell to some chains without NutriClean certification. "NutriClean is an established market," he said. "Certain chains handle it and unless you have it, you don't do business with them."

NutriClean's Engbeck verified that the number of retail participants has not grown appreciably in the past year. But Brown believes the list of participants will soon grow.

"What I see is the groundwork being laid by several retail buying groups to become involved next year," she said. "Although what you see publicly may not look like retail growth, there are retailers that aren't full-fledged members who are taking certified product and they are beginning to incorporate pesticide levels into their overall buying decisions."

NutriClean's retail client list includes 10 retailers and distributors. The retailers range in size from the six-store Bread and Circus whole foods chain in Boston to the 500-store wholesale grocer Provigo Distribution, Inc. in Montreal, Quebec.

Many of the growers mentioned the 65-store Raley's chain (Sacramento, CA) as the primary reason they began certifying produce through the NutriClean program.

Raley's began using the NutriClean retail testing program several years ago in response to the food safety issue, accord-

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"In the year and a ... the program ... said ... product ... is ... tested for detectable residues, and retailers are provided with a list of certified growers.

"We began to realize that our customers were getting a lot of negative information on food safety," said Collings. "Several years ago, we had a watermelon scare, so we decided to go to independent testing to reassure customers that our product is safe."

According to Collings, growers initially resisted the certification program. "A lot of growers who were initially negative regarding the program have come to realize that this is an important merchandising tool," said Collings.

The amount of NutriClean certified produce at Raley's varies from season to season. Items with year-round availability such as broccoli, head lettuce, carrots and potatoes are frequently NutriClean certified. Other seasonal items, such as melon, are offered as certified typically during their local growing season. At any given time, 15-20 percent of the produce on Raley's stands is NutriClean certified.

Raley's merchandises the program with in-store signage on all NutriClean product, and frequently promotes a NutriClean product in its ads. "I'm looking at our ad out today, and we've got head lettuce from Tanimura & Antle that's certified to be fr... of detected pesticides," said Collings.

However, Raley's does not factor the cost of the program into its produce prices.

"We pay for the testing, but we're always ...riced according to competition ...rated ...outines. "We don't feel our customers should have to pay for the certification.

Nor does Collings believe they would. For the most part, there is not the demonstrated willingness to pay more money for certified product," he said.

However, consumer response to the NutriClean program has been overwhelmingly positive, Collings said. "We've had many, many letters and phone calls from customers indicating they shop with us because of that, because we are doing something to reduce pesticide use. I don't think they are reacting to a scare. Pesticides wear a black hat, so anyone who is doing something to reduce that the customer looks favorably upon."

While the 45-store chain Fred Meyer Inc., based in Clackamas, OR, does factor the cost of the NutriClean testing program into its produce prices, executives believe customers are getting a bargain.

"The NutriClean program is one way of providing assurances to customers without them having to pay the high costs associated with organics, because organics are dramatically higher," said Rob Boley, director of public relations, Fred Meyer Inc.

"We primarily take advantage of NutriClean produce available to us," he continued. "We are able to do that because we are a member of the NutriClean dock te..."

NutriClean Retail Clients

...ains the list of retailers who participate in the NutriClean dock testing program is relatively short, it does contains some names to reckon with.

ABCO Markets, 75 stores, based in Phoenix, AZ.

Andronicos, 5 stores, San Francisco, CA.

Bread and Circus, 6 stores, based in Boston, MA.

Fred Meyer Inc., 40 stores based in Eugene, OR.

Harry's Farmers Market, 2 stores, based in Alpharetta, GA.

Provigo Distribution, 500 stores, based in Quebec, Canada.

Raley's, 65 stores, Sacramento, CA.

Ralphs Grocery Co., 154 stores, Los Angeles, CA.

RLB Food Distributors, a West Caldwell, NJ-based distributor that services more than 200 retailers in the Greater Metropolitan New York area, including King's Super Markets and D'Agostino's.

Stop & Shop Supermarket Co., 117 stores, based in Boston, MA. ■rs

ng program. Every week, we take random samples of what comes in. We direct our purchases to the companies who are outperforming government levels."

Through this testing program, he added, "we are able to identify growers who have the best produce in terms of pesticide residues. That doesn't mean they don't use them, but their pesticides are integrated into the growing process in such a way that pesticides are eliminated or reduced."

At the time he was interviewed, Bolev reported there were about 20 NutriClean products available in Fred Meyer's stores. "In some cases they cost a little more, and in other cases they are comparably priced

non-certified produce," he said.

Bolev said the chain does advertise the NutriClean program if a certified product is on ad. "The logo is added and once a month we may put a box in the ad explaining the program," he said.

As in the growers program, information is one of the most important services NutriClean provides. Some retailers who participate in the NutriClean retail dock testing program don't do so for its merchandising benefits.

Take, for instance, the whole foods chain Bread & Circus, based in Newton, MA. "We are devoted and committed to sustainable agriculture, which includes organically grown foods and low pesticide use," said David Doctorow, produce coordinator. "We have a whole warehouse committed to receiving organically-grown foods, but we don't use NutriClean for helping with organic farming. We use NutriClean to help stay up on issues. We never market product as NutriClean certified. We use it for our own knowledge."

Doctorow said his chain attracts a lot of vegetarians and people who consume more than the average amount of fruits and vegetables. "The average store does 10 - 14 percent of sales in produce," he noted. "We average 24 percent in produce."

While the chain doesn't advertise NutriClean product, it does publicize the dock testing program in the stores, particularly at times of peak concern to it consumers, such as during the recent concern about Aldicarb and bananas, and during the winter, when a lot of imported fruit is on the stands.

Bridging a Period of Adjustment

While Doctorow reports that more professional growers are growing organically today compared to 10 years ago, most of the major growers interviewed do not believe pesticide use can be totally eliminated.

"People who believe the world could be fed without chemicals should know that in countries too poor to use them, 50-70 percent of the food that could have been produced is lost," said Mike Payne, general manager, Fresh Western Marketing Inc. in Salinas, CA, a producer of 60 different vegetable commodities.

What Payne and other like-minded growers have done is employ a wide range of alternative pest control measures, using chemicals only when necessary and at specified growing periods.

"It wasn't so long ago that growers turned pesticide use over to a pest management company," recalled Payne. "Sometimes it was what the industry came to know as a 'blue plate special', a little of a dozen different chemicals.

"Now we make sure we are not putting on anything more than we need to control the pest involved. And we post our fields so that everyone is warned that pesticides are involved."

Payne is also using the age-old techniques of crop rotation, in addition to beneficial insects. "No one method, including chemicals, works," he said. "It has to be an integrated approach."

Payne contracts with Primus to test almost every commodity produced, including small acreage crops such as cilantro and dandelion greens.

"We have some clients who will test on 1/8th of a field of dandelion greens and that's a hell of a commitment," said Stovcik. "Our cost is still the same whether it

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...n alternative technique used by Thomas in its sweet potato fields is to keep the ground as rich with organic matter to keep the dreaded nematode at bay.

"We keep our organic matter as high as possible so nematode will feed on that," said Meninger. "We can plant an acre or rye for $15 and before we plant our crop, we plow it into the soil. Rye is the organic matter, and we also use quite a bit of manure as compost. The two together are what bring the soil to life."

The conventional way to stop the nematode, which attacks the root of the sweet potato, is fumigation. "A lot of what we do is outgrow a pest by keeping the ground ...h and make sure such that when we are being attacked by the nematode, we grow right through it," said Meninger.

However, the cost of growing without fumigants is steep. "Once we get a piece of soil built up to where it should be, it's cost comparable," he said. "But it takes time."

About 40 percent of A.V. Thomas's sweet potato crop is grown commercially, 45 percent is NutriClean certified and the other 15 percent is organically grown. "We get more for organic than anything," Meninger said, adding that the greatest growth in demand has been for organic product.

For the first time in his life, Hamaguchi has seen spider webs growing across his rows of almond trees. "Our farm advisor ...d we let the grass grow and allow the bugs to come in," he explained. "The natural flora attracts the bugs. We've had lace wings and ladybugs, which eat aphids. We've had spider webs grow across the rows where we never had them before, spiders eat a lot of bugs."

Hamaguchi has not harvested his almond crop yet, but he's been cracking some nuts and hasn't seen any worms. "The thing with farming is that every year is different," he said. "With natural farming, you don't have enough control. When you go natural, you rely on Mother Nature more."

Hamaguchi also has about 100 acres of sweet potatoes. He estimates that five acres will be organic, 35 NutriClean certified and the rest will be conventionally grown. Previously, all acreage was NutriClean certified.

"There's so much NutriClean product out there, and Ralev's is spreading its business around," said Hamaguchi. "We felt we didn't want to go to the expense of NutriCleaning all of our acreage."

According to Lane of Gourmet Gardens Produce, reducing pesticide use in his greenhouse environment is definitely more expensive than just spraying the cucumbers with chemicals.

"Beneficial organisms are definitely more expensive than spraying with chemicals," said Lane. "If I were to eliminate pesticide use, we'd be looking at $15,000 to $20,000 per year just in little wasps. If we apply chemicals, it's $2,000."

However, Lane said a lot of chemicals registered for hothouse cucumber growing simply don't work, particularly in controlling the white fly on hothouse cucumbers. "But the wasps are effective," he said.

Though Lane can get more production using chemicals, he gets a higher price for organically-grown cukes. "We were getting $4 per case on cucumbers that weren't sprayed," he said. "It paid for itself, but not by much. When you look at higher costs and lower yields, there wasn't a great difference in profit margins. Hopefully, over time, we will get production up with biological controls and then the margins will be quite a bit better."

For the moment, however, the experiment is on hold. The company is looking to relocate its business because of problems with the lumber company that provides the hot water used to heat the green houses.

When relocated, the experiment is likely to continue. "It seems that pesticides are definitely an item consumers are concerned about," said Lane. "In business, the idea is to provide something customers demand rather than say, 'Your fears are unfounded'."

However, a recent experiment to reduce pesticide use by another grower failed miserably, and the fields have now been designated for research only.

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tatie Growers says the grower set aside $5 of 4,000 acres for organically grown artichokes.

Our organic production went down significantly over the last two years," she said. "Problems masked earlier are starting to show up now."

The first year just 10 percent was culled, but this year the figures were reversed. Just 10 percent was packed and 80 percent thrown out.

We've discovered several problems in organic, and one was the use of the beneficial insect pheromone in controlling the primary pest in the artichoke field," she explained. "We have discovered that it is almost useless.

The soil has gone anaerobic at root depths necessary for the absorption of water, and the plants are not very healthy compared with the conventionally grown ones, even though we've given organic our best producing fields.

"Artichokes are a different kind of critter. They're perennials and quite different than crops in the ground for three months."

The grower is working with Cornell University to figure out what went wrong. The organic fields have been designated a research plot, and the grower is not planting or selling any produce from those fields.

In a more promising experiment, Tanimura & Antle went to great expense to install a drip irrigation system that will enable the company to reduce its water consumption, as well as control pesticide use.

"We feel that is going to give us a reduction in water usage as well as pesticides and fungicides, particularly fungicides," said Eldredge. By applying water directly to the roots of lettuce, the grower reduces the need for fungicides because the produce is not drenched with water, which promotes the growth of mold.

T & A has also developed a method of careful pesticide application over time. "We've learned to apply pesticides at certain stages of plant growth so that there will be no detectable residues, and we've spent a lot of time learning how to farm this way," said Eldredge. NutriClean has some guidelines, but it's trial and error. It's definitely a learning experience."

The use of beneficial insects, such as ladybugs, and the use of the Salad Vac, a suction device that attaches to a tractor and sucks insects including the white fly off the plants, are two more alternative methods used by T & A.

Economics Still Uncertain

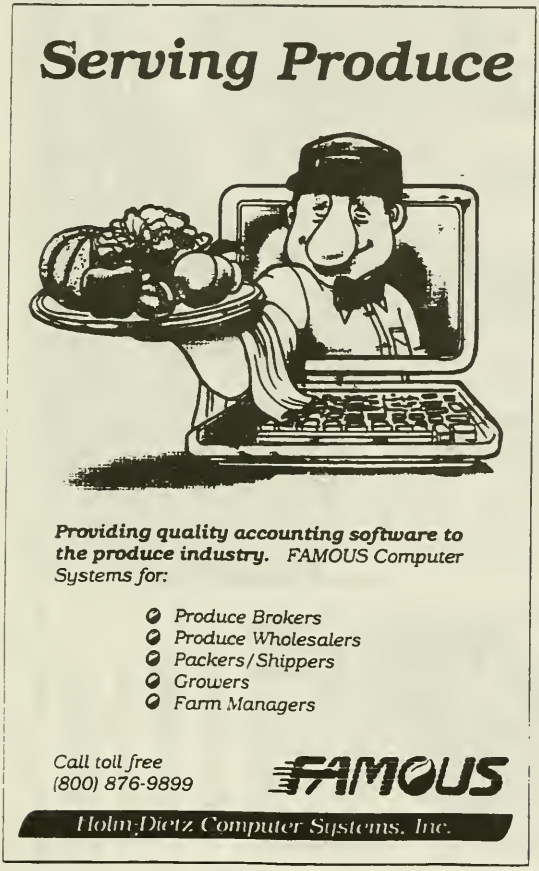
However, the economic viability of these experiments is still up in the air, according to Eldredge. "The key factor we're looking at is yields," he said. "We don't know yet with drip. We know we have a hell of an investment in drip irrigation. Will it cost less? I doubt it. I just hope it doesn't increase it."

An air of uncertainty hangs over these experiments. Adding to that uncertainty is the fact that though consumers are concerned with food safety, they don't seem to be willing to pay more for certified produce.

"When you reduce your pesticide applications, you can't say what production would have been had you used them," said Silva. "But you also may have gotten something, a residual effect from past applications. Until that is knocked out, you don't know what will be."

Silva has used NutriClean for the past two years. "I have a couple of wholesalers who use it," he said. "It's not important, not this year. The true answer to whether pesticide reduction is economically viable will take place in the next five to 10 years. In the past, we've had our parathion and our malathion, and now someone is going to have to come up with something if they want agriculture to stay in this country."

California Artichoke continues to attempt to reduce pesticide use throughout its broccoli and cauliflower fields through the use of beneficial insects and controlled pesticide applications. "We are following all the literature in trying to cut back," said Hopper. "We understand the problem and if it's more economical to do something, we will do it. But we see this as a long-term experiment. It's not going to happen overnight." ■PB



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January 16, 1992

PESTICIDE ROULETTE

How Banned U.S. Chemicals Turn Up On Your Table

LETTUCE BE SAFE: Raley's offers Nutriclean certified produce with no detectable pesticide residues.

Eaten any fresh tomatoes lately? Any bananas? How about bell peppers, grapes, leaf lettuce, tangerines? If so, chances are that they were imported from Central or South America, which means that illegal or unregistered pesticides may very well have been used in their production.

Worst of all, you can be 98 percent sure they were never tested for residues from these dangerous chemicals before they reached your dinner table.

Most people know that during the winter months local retailers turn from domestic fields to foreign growers in order to stock their shelves, but few realize the special health hazards posed by imported produce.

Although the Environmental Protection Agency prohibits the sale of the worst cancer causing pesticides in the United States, American companies routinely produce and export these toxic chemicals for use on the foreign crops that make their way onto the produce shelves and into our diets during the winter months

The end result is that consumers may find themselves unwitting participants in a frightening game of pesticide roulette.

During the winter months, about 30 percent of the produce in your local market is imported, with most of it coming from Latin American countries such as Mexico, Honduras and Chile. While U.S growers have faced tighter and tighter restrictions over their pesticide use, there are virtually no governmental controls over what is sprayed in many foreign countries and almost no government testing of this produce when it reaches our shores.

By Joe Martin

"Domestic crops are one thing," says Jim Knutzon, senior vice president of Scientific Certification Systems (SCS), an Oakland firm heavily involved in pesticide residue testing. "Imported produce is a whole different arena.

"Sometimes there are no rules, no enforcement, nothing," Knutzon explains. "If you are a 100-hectare banana grower in, let's say, Costa Rica, you can spray any damn thing you please.

"I've had a lot of exposure to foreign growers and foreign products," he continues. "Growers have disclosed to me the use of illegal and unregistered pesticides. I know that there are uses in foreign countries that go beyond U.S. standards."

In fact, the use of illegal pesticides among Latin American growers seems to be common knowledge in agricultural circles. In addition to these banned substances, many chemical companies bypass government restrictions altogether by selling unregistered, untested substances to foreign growers.

By World Health Organization estimates, agricultural workers in developing countries suffer 3,000,000 cases of acute pesticide poisoning each year (including 20,000 deaths) as the result of this practice. Though the net effect on U.S. consumers is not known, the National Academy of Sciences projects that we will see an additional 1,000,000 cases of cancer over the course of our lifetimes caused by the ingestion of banned and unregistered pesticides with food.

By U.S. Food and Drug Administration estimates, 5-10 percent of imported produce is contaminated, but that's only the tip of the iceberg. For one thing, the agency tests less than 2 percent of all foreign shipments. Besides, the tests that are run account for only about 120 of the more than 600 chemicals currently on the international market.

"The FDA uses multiple-residue tests," Knutzon says. "That's an economic decision. You get the most for your money that way. But a lot of the substances that are in use can only be detected by specific, single-residue testing."

Perhaps even more disturbing is the fact that even when unhealthful levels of pesticides are discovered by the FDA, the produce is often sold to the public anyway: "Urgent" testing takes an average of 28 days, which means that by the time results are known contaminated produce has often been sold and eaten.

For example, in one General Accounting Office survey, 73 of 164 shipments of contaminated produce were never impounded and were "presumed to have been consumed by the public."

The bottom line is that there are absolutely no controls over what pesticides can be sold to foreign growers, and the government has no effective program to keep these harmful substances from making their way back into this country as a part of your winter diet. Fortunately for consumers, however, some food retailers have decided to take matters into their own hands.

"Retailers make all the difference," says Linda Brown, a public-relations officer for NutriClean, SCS's pesticide testing program. "They are the leverage point. If a retailer doesn't care, then there's not much incentive for a grower to clean up his act.

"In the case of Raley's, Fred Meyer's, and Ralph's, they're doing something that's very unique," says Brown. "They're putting their produce through a much more comprehensive testing, but they aren't charging the public more for it. They don't always get credit for that."

(Actually, Chico's new Fred Meyer store is something of an exception to the company's general policy. While the produce in the chain's Oregon stores all comes through a central warehouse in Portland and is subject to testing under the NutriClean program, the Chico store buys from Chico Produce, Inc. The local firm receives some NutriClean-tested produce but does not contract exclusively with SCS.)

"NutriClean's certified produce costs about one to two dollars more per case, and sometimes that means a few extra cents per pound in the store, but it seems most consumers are willing to pay that," says Bruce Park, owner of Chico Produce, which supplies Gold Country, Holiday Markets, S&S Produce and several local restaurants in addition to Fred Meyer.

Most retailers continue to rely on government testing, but Park thinks that may be about to change. "It's been a very good thing for Raley's," he says, "and now a lot of other companies are starting to look into similar programs."

NutriClean's system offers two kinds of testing programs: dock testing and certification. Dock testing involves a weekly random sampling of produce shipments to test for pes-

ticides that government agencies do not screen for, that have a history of leaving high residue levels, or are under special review.

Under the certification program, growers make extensive confidential disclosures about which pesticides have been used on a given crop, and complex, single-residue tests are performed after harvest. Unlike the FDA's, NutriClean's testing takes only an average of two days. In addition, when a shipment is "certified," that means there is no allowance for "tolerable" levels of carcinogenic pesticides.

"In working with cancer causing substances, it's impossible to establish a tolerance level, because we just don't know enough about how these substances interact with living tissues," Brown contends. "With the NutriClean Certification program, we're striving for no detectable residues."

Nevertheless, the program cannot absolutely guarantee the safety of foreign-grown produce.

"Safe is a spooky word," Knutzon says, "and I wouldn't use it. The stores that use [NutriClean] are more likely to find the illegal or unregistered pesticides than other stores, but I wouldn't say the stuff could never end up on the shelf. It could."

Congress is currently considering banning the exportation of illegal and unregistered pesticides, but Knutzon has doubts about the ultimate effectiveness of the "Circle of Poison" legislation (Senate Bill 898). "If you're a multinational chemical company, and you're doing a $100-million-a-year business selling a particular substance," Knutzon says, "you'll just produce it somewhere else if you can't export it from the United States."

In Knutzon's opinion, the "circle of poison" could be broken only through an unprecedented level of international cooperation. "You would have to establish a level of protection for consumers and make it uniform across all production and consumption places, but we're a long way from having this happen," Knutzon laments. "Continuity in international trade is very, very difficult to establish."

Meanwhile, there are some things consumers can do on their own to protect themselves. First, they may simply wish to forgo summer fruits and vegetables during the winter months imports are most commonly available.

If that sounds impossible, be careful where you shop: Some stores are much more conscientious about pesticides than others, and some, like Chico Natural Foods, carry only locally grown or certified organic produce. Finally, always be sure to wash your produce thoroughly, preferably with lightly soapy water, but be especially careful during the winter months.

"We wash celery, leaf lettuce, and a couple of other things just to get the dirt off and keep things crisp," says Mike Van Horn, produce manager for the Chico Albertsons. "But we can't possibly wash everything. We assume people take things home and wash 'em."

Knutzon agrees. "Wash everything you can wash. Peel everything you can peel." □

Mr. TOWNS. Ms. Marose.

STATEMENT OF BETTY MAROSE, COORDINATOR, INTEGRATED PEST MANAGEMENT, MARYLAND COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF MARYLAND

Mr. MAROSE. Thank you, Mr. Chairman. I am Betty Marose, integrated pest management coordinator for the Maryland Cooperative Extension Service at the University of Maryland. I have conducted statewide education and applied research programs in integrated pest management since 1980.

During this time, I have watched researchers struggle for funding to tackle basic questions of pest biology and management. I have watched fewer extension people working harder to disseminate IPM technology to the agricultural community. I have watched pest management consultants come and go as they strive to make a living from IPM. The bright note is that I have watched growers reap the benefits of IPM.

Most of these growers have not made radical shifts from conventional, pesticide-dependent practices to strictly organic production. Instead, they have gradually incorporated new technologies into their operations to create more environmentally and economically sound systems. They and their advisors have learned to more accurately identify pest problems, to carefully monitor pest populations, and utilize economic thresholds in their decision-making processes.

They have relied on nonchemical alternatives whenever possible and have resorted to pesticides only when necessary to prevent economic loss.

Let me give a few examples from Maryland to confirm these changes. In the early 1970's, the sweet corn processing industry averaged 2.5 insecticide treatments per acre per year. In the mid-1970's, we initiated a pilot IPM project including a monitoring program that relied on field sampling, black light traps and pheromones to predict damage from ear-feeding insects.

As a result, processors cut insecticide treatments in half while improving crop quality. These techniques have now been adopted by all major processors in the region and the work is now self-sustaining. Similar techniques have been adopted for fresh market sweet corn with comparable results.

In 1989 Extension initiated a pilot program on tree fruits. Three years into the project, surveys indicate that the amount of pesticide used per acre by IPM participants is 23 percent less than nonparticipants on apples and 40 percent less on peaches. Fruit yield and quality are equal or better in IPM orchards and all products are marketed through traditional channels at standard prices.

These kinds of activities are occurring on many commodities in every State across the country. In fiscal year 1992, $8.2 million in Federal funds and an additional $8 million in State funds resulted in $2 billion in economic benefits, a return of approximately $130 for each public dollar spent on IPM. This does not include difficult-to-quantify food safety, worker protection, water quality and environmental benefits.

Since IPM is economical and effective, what is limiting implementation? In my experience, there are three broad issues constraining wider adoption.

The first of these is insufficient capacity for information delivery. The second is greater need for basic and applied research on pest biology, economic thresholds and nonchemical alternatives. The third is the existence of conflicting rules and regulations which discourage the use of IPM and development of nontraditional control tactics.

As Ed Glass pointed out in a book [Glass, Edward H. 1992. Constraints to the Implementation and Adoption of IPM. Pgs 167–174 in food, crop pests, and the environment. F.G. Zalem and W.E. Fry, eds. APs Press, St. Paul, Minn. 179 pp.], which I think you would find valuable to read, talking about constraints, he says that "IPM is difficult to define, not because it is so complex or abstract, but because it is an approach to pest control. It is a strategy rather than a specific and exact methodology. Its strength is in its adaptability in one form or another to all pest problems."

IPM may not be difficult to define but it can be difficult to research, teach, and implement precisely because of its complexity. It is site specific, it varies by crop, field, farm and region, requires timely monitoring and incorporates a wide variety of management techniques. IPM is not a static set of practices, but rather a dynamic process that can be individualized. Because of this tremendous complexity, IPM requires high levels of knowledge and it is not easily regulated or mandated. This information, whether provided by Extension, consultants, agribusiness or growers themselves is the key to implementation of IPM.

Extension has tradionally been the leader in providing this information but has been crippled in recent years by limited resources. Federal IPM Extension funding was level throughout the 1980's and has increased only slightly in the last 2 years. Additional State funding has been available in some States, but not others.

Limited resources have changed the way Extension functions. One-to-one farm visits with growers have been replaced by workshops, newsletters, and computer expert systems. While these are valuable tools, adoption of new technology still often depends on farm demonstrations and personalized guidance in the early pilot stages to overcome technical details and perceived risks.

As pilot programs mature, implementation is turned over to growers, consultants and agribusiness. Some growers, particularly the young, better-educated ones, may have the knowledge and time to fully implement IPM on their own. Others may be too busy or overwhelmed by details, but may choose portions that are most suitable for their own situation.

Surveys in Maryland show that 60 to 70 percent of growers are using a number of IPM practices. Independent consultants are available in some regions but not in others primarily due to seasonal work and scattered, diverse cropping systems.

Delivery of current IPM information has been highly successful across crops and regions, but massive implementation will require greater education and demonstration efforts.

As IPM evolves, its future lies in improved nonchemical or biorational alternatives. We do not currently have the technical ability to provide exclusively nonchemical pest management on a scale which ensures the stable, low-cost food supply that Americans have

come to expect. Current practices depend on synthetic organic pesticides because they are economical, reliable and easy to use.

In contrast, many nonchemical alternatives are target species-specific, labor-intensive, weather-dependent, costly and may require better management skills. Biorationals including Bt and others have tremendous potential, but face economic and regulatory constraints. Current registration and certification procedures are viewed by many as being restrictive to the point of inhibiting the development of new biorationals.

Developing nonchemical alternatives will require bold new research and education efforts. Cultural, mechanical or biological approaches that cannot be patented offer little chance of monetary returns and many programs will require long-term support.

As IPM systems evolve, we must make sure that unnecessary rules and regulations do not stand in the way. EPA registrations, conservation and commodity program, crop insurance, et cetera, may need to be more flexible to allow for IPM.

In conclusion, I would like to say that IPM is a sound approach that can bring producers and environmentalists to the same table to discuss future directions. It is a common ground that simultaneously works toward the goal of profitability, food safety, water quality and environmental protection. By addressing the recommendations previously stated, integrated pest management can help make America's food supply safe and abundant for all.

[The prepared statement of Ms. Marose follows:]

Testimony Presented to the U.S. House Subcommittee on Human Resources and Intergovernmental Relations. Tuesday July 27, 1993

I am Betty H. Marose, Integrated Pest Management (IPM) Coordinator for the Maryland Cooperative Extension Service, housed at the University of Maryland in College Park. I have conducted statewide education and applied research programs in IPM since 1980.

During this time I have watched researchers struggle for funding to tackle basic questions of pest biology and management; I've watched fewer Extension people working harder to disseminate IPM technology to the agricultural community, I've watched pest consultants come and go as they strive to make a living from IPM, and the bright note is that I've watched growers reap the benefits of IPM.

Most of these growers have not made radical shifts from conventional, pesticide dependent practices to strictly, organic production. Instead, they have gradually incorporated the newest technologies into their operations to create more environmentally and economically sound systems. They or their advisors have learned to more accurately identify pests, to carefully monitor pest populations, and to utilize economic thresholds in their decision-making processes. They have utilized pesticides only when necessary to prevent economic loss and when feasible, they have substituted non-chemical alternatives.

Let me give a few examples from Maryland to confirm these changes. In the early 1970's, the sweet corn processing industry averaged 2.5 insecticide applications per acre per year. A pilot IPM project introduced black light trap and pheromone monitoring techniques coupled with field sampling as a means of more accurately determining the need for treatment of two ear-invading insects. In the following 15 year period, processors cut insecticide treatments in half and improved overall crop quality. These techniques have been adopted by all the major processors in the region and the work is now self-sustaining.

In 1989, Extension began a pilot program on tree fruits. Three years into the project, surveys indicate that the amount of pesticide active ingredient used per acre (ai/A) by IPM participants is 23% less than non-participants on apples and 40% less on peaches. Fruit yield and quality are equal or better in IPM orchards and all products are marketed through traditional channels at standard prices. Many producers display University provided signs in their markets describing IPM production techniques. Although growers are very supportive of the IPM process, we anticipate difficulty in retaining experienced, qualified scouts after the initial cost-share phase of the program.

These kinds of activities are occurring on many commodities in every state across the country. In FY 92, Federal expenditure of $8.2 million (Smith-Lever 3(d) funds) plus State contributions of over $8 million on IPM education resulted in $2 billion in economic benefits -- **a return of approximately $130 for each public dollar spent on IPM** (Fitzner, 1993). This does not include difficult to quantify food safety, worker protection, water quality and environmental benefits.

Since IPM is economical and effective, what is limiting implementation? In my experience, there are three broad issues constraining wider adoption of IPM. The first of these is insufficient capacity for information delivery and consulting services. The second is a greater need for basic and applied research on pest biology, economic thresholds and non-chemical alternatives. The third, is the existence of conflicting rules and regulations which discourage the use of IPM and development of non-traditional control tactics.

Education, information delivery and consulting services are critical to IPM because as Glass (1992) pointed out, "IPM is difficult to define, not because it is so complex or abstract, but because it is an approach to pest control. It is a strategy rather than a specific and exact methodology. It's strength is in it's adaptability in one form or another to all pest problems."

IPM may not be difficult to define, but it can be difficult to research, teach and implement, precisely because of its complexity. IPM systems are site specific, they vary by crop, crop system, field, farm and region. They require timely monitoring and incorporate a wide variety of management techniques. IPM is not a static set of practices, but a dynamic process that can be individualized for each unique setting. Because of this tremendous complexity, IPM implementation requires high levels of knowledge and management skills.

Extension has traditionally been the leader in providing this information to growers, scouts, consultants and agribusiness. However, Extension's ability to deliver educational programming has been crippled by limited resources. Federal IPM Extension funding was level throughout the 1980's, but has increased slightly in the last two years. Additional state funding has become available in some states, but not others.

Limited resources have changed the way Extension functions. Gone or greatly diminished are the one to one farm visits. In their place are clinics, workshops, newsletters, tip-a-phones, fax alerts and expert systems designed to provide timely IPM information to the agricultural community. While these are all valuable tools, adoption of new technology still often depends on farm demonstrations, and personalized guidance in the early pilot stages to overcome fears and perceived risks.

As pilot programs mature, implementation is turned over to growers, private consultants and agribusinesses. Many growers are too busy to learn all the details, but may chose portions most suitable for their situation. Others rely on the agrichemical dealer/applicator for advice. These commercial agribusiness persons are generally the most difficult group to switch to IPM approaches. This is partly the nature of their business, but also reflects concern about liability if controls fail. In some areas, agrichemical dealers provide "free" scouting services while in other regions these services are more comparable to independent consulting services.

Independent, private consultants are well established in Florida, California and the Midwest where year round growing conditions or concentrated agriculture occur. However, consultants are less successful in the Northeast and Mid-Atlantic, where short seasons and scattered, diversified farming exist. Here a consultant must be competent in the management of over 15 crops and 350 associated pests. An experienced consultant may cover no more than 5,000 to 10,000 acres for a gross income of $15,000 to $50,000. Business expenses, health

insurance, retirement, and taxes may reduce net income to $8,000, an unacceptably low return considering the education and experience required for the job. Without incentives, subsidies or broader service offerings, consultants cannot survive in some regions.

Delivery of current IPM information and services has been highly successful, but erratic across crops and regions. Massive implementation, for the more difficult crops, regions, or late adopters, will depend on greater education and demonstration efforts and may require incentives or subsidies for full implementation.

As IPM evolves, its future lies in the development of improved non-chemical or biorational alternatives. We do not currently have the technological ability to provide exclusively non-chemical pest management on the scale necessary to ensure the stable, low cost food supply Americans have come to expect.

Modern synthetic organic pesticides are cheap, easy to use, readily available, broad spectrum, highly effective and often provide some residual control. In contrast, many non-chemical alternatives are more labor intensive, costly, weather dependent, require better management skills, and are perceived as more risky. For example, hand weed control in vegetables may exceed $500 per acre (provided a labor source is available) as compared to less than $30 per acre for herbicide treatment.

On the other hand, several biorationals including mating disruptors, various formulations of *Bacillus thuringensis* (Bt), and commercially available predators, parasites are already in the market and competitively priced. Current registration and certification procedures are viewed by many as being too restrictive and an impediment to rapid develop of additional biorationals.

Developing non-chemical alternatives will require bold, new research, demonstration and education efforts. Cultural, mechanical, or biological approaches that cannot be patented offer little chance of monetary return to developers and thus will require funding from non-commercial sources. Many of these systems will require long term investigation of evaluate effectiveness, thus granting agencies may need to extend grant terms.

With existing IPM systems and as new non-chemical systems evolve, we must make sure that unnecessary rules and regulations, do not stand in the way of their implementation. Current conservation and commodity programs often discourage tillage and crop rotations as means of reducing pest pressures. Crop insurance, farms loans, cosmetic standards and interstate commerce regulation sometimes encourage greater use of pesticides. These regulations need to be evaluated carefully and possibly modified to allow greater flexibility in IPM systems.

CONCLUSION:

IPM is a sound approach that can bring producers and environmentalists to the same table to discuss future directions. It is a common ground that simultaneously works toward the goals of profitability, food safety, water quality and the environment. By addressing the attached recommendations, Integrated Pest Management can help make the American food supply safe and abundant for all.

RECOMMENDATIONS:

1) Enhance funding for basic and applied research in non-chemical alternatives

2) Provide incentives or minimize impediments to commercialization of biorationals

3) Enhance funding for education, demonstration and delivery programs for growers, consultants and agribusiness

4) Place emphasis on voluntary, educational programs rather than rigid, mandatory compliance to achieve gradual, site specific implementation

5) Provide incentives for development of an independent, service sector to deliver integrated crop management advice

6) Minimize rules and regulations that adversely impact adoption of IPM

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Mr. TOWNS. Thank you very much, Dr. Marose. Why don't I start with you.

The food industry says it fully supports IPM. In your opinion, how can the food industry of IPM growers coordinate their objectives and increase IPM's methods of food production?

Ms. MAROSE. I think the biggest impediments rights now are that we don't have a broad enough range of nonchemical alternatives in many cropping systems, and we don't have a strong enough delivery system to make available to growers the information we have. I think we need to coordinate our efforts to develop more nonchemical alternatives and make better efforts at delivering that information to growers.

I think once growers see the benefits they do adopt these programs quite easily.

Mr. TOWNS. Mr. Panetta, how can the public be assured that the introduction of a new bacteria would not end up more hazardous than the pests it was created to control?

Mr. PANETTA. All of these products go through an extensive review process through the EPA Pesticide Registration Program. We field test them extensively before they are commercialized.

In the case of CellCap, we will the product before it is released to the field to ensure that there won't be any controversy over the possibility that such an organism might be able to exist and exist over the other organisms in the field.

Mr. TOWNS. In other words, there is no way it could develop a resistance to the product?

Mr. PANETTA. We have studied that and some scientists say that there is a possibility that even with biological products, there is a possibility that resistance can be developed. One of the advantages we have through genetic engineering is we have a library of hundreds of different Bt genes, and we feel that by alternating the genes in these pesticides, we can inhibit the development of resistance. In some cases, putting multiple genes in that make it even more difficult for the insect to develop resistance.

A lot has to do with good management by the farmer as well.

Mr. TOWNS. I yield to Mr. Schiff.

Mr. SCHIFF. Mr. Chairman, I found the testimony, but I don't think I have a set of questions. This puts questions in mind for when the Government comes and testifies in response to the ideas expressed here, so I thank the witnesses.

Mr. TOWNS. Thank you very much.

Let me thank all of you for your testimony. I feel this is a very important topic and there is a lot of interest in it around the country. Thank you for coming and testifying before the committee.

Mr. TOWNS. I would like to call our fourth panel: Mr. Richard Wiles, director of the agricultural pollution prevention project of the Environmental Working Group and coauthor of "Pesticides in Children's Food"; Dr. Rebecca Goldburg, Environmental Defense Fund; and Dr. Neill Schaller, Henry A. Wallace Institute for Alternative Agriculture.

Let me thank you again for coming, and of course, you have probably heard us go through it in terms of the fact that you have 5 minutes to summarize your testimony and that your entire testimony will be included in the record.

Why don't we start with Mr. Wiles.

STATEMENT OF RICHARD WILES, DIRECTOR, AGRICULTURAL POLLUTION PREVENTION PROJECT, ENVIRONMENTAL WORKING GROUP

Mr. WILES. Thank you, Mr. Chairman and distinguished members of the subcommittee. I am Richard Wiles, director of the agricultural pollution prevention project at the Environmental Working Group.

Today the Environmental Working Group, the national PTA, Consumers Union, Physicians for Social Responsibility, and Public Voice call upon the Federal Government to pursue the option of buying low-residue or organic food for the National School Lunch Program and breakfast program, Head Start, and other large Government food purchasing programs. Just as the Federal Government purchasing has driven product innovation and created markets in other areas, a government market for low-residue fruits and vegetables will create rewards for farmers who use less pesticides, and will engage market forces in the implementation of the administration's new commitment to pesticide use reduction and the promotion of sustainable agriculture.

Safe food is often presented as an either/or paradigm, either we can continue with a today's abundant, affordable food supply or we can have safer food that looks terrible, costs twice as much, and is not consistently available. This is, of course, a false dichotomy that only serves the interests of those who wish to continue current levels of pesticide use and to deny consumers expanded choices in the marketplace. Safer food is being delivered to some consumers right now at competitive prices in abundant supply of the highest quality.

Let me describe several economic realities of pesticide use in American agriculture.

First, most farmers use more pesticides than they need. This occurs for a number of reasons. There are no regulatory or market incentives forcing maximum efficiency in pesticide use. Regulations encourage use up to maximum levels and give no advice regarding the effectiveness of pesticides at anything less than the maximum rate. The majority of farmers receive pest control advice from pesticide dealers and salesmen, who also have little incentive to encourage reduced use. There is no coherent research and demonstration program at the USDA designed to help farmers use less pesticides; and pesticides are like insurance, they are a relatively minor percentage of overall production expenses, but at the same time they substantially reduce economic risk.

In the absence of regulatory action and clear market reward and with no pressure to account for the environmental and health consequences of pesticide use, farmers will continue to use the same amount of pesticides that they always have.

Second, and of direct bearing on the subject of today's hearing, changes in pesticide use on the farm have almost no impact on consumer prices. First, pesticides are a small portion of overall farm operating expenses. Nationwide pesticides account for about 4 percent of overall farm production expenses. Changes in pest control

costs therefore have a marginal effect on overall profitability and even less effect on consumer prices.

Middlemen and marketers control consumer prices. Modest price increases and decreases in any farm input rarely affect the price of foods. This is largely because processing, packaging, transportation and advertising claim about three-quarters of consumer food expenditures, leaving farmers on average with about 25 cents of every $1 spent in the supermarket. The 4 percent of total production costs accounted for by pesticides amount to 1 percent or less of the price consumers pay for food.

Thus, there are scores of alternative pesticides and pest control methods. About 25 major pesticides have been removed from the market in the past 15 years. In no case did the cancellation of a pesticide result in significant crop losses or food price increases for consumers. In fact, the average U.S. citizen continues to spend less of his or her disposable income for food than in any other industrialized nation.

There are three basic options for consumers in the marketplace: organically grown food, food certified to have no detected residues, and conventionally grown food. Two of these, organic and no detected residue food, currently provide safer food to consumers. Organic food is produced with no synthetic chemical pesticides, synthetic chemical fertilizers, growth hormones and no prophylactic use of animal antibiotics.

In some cases, organically grown crops are competitive with conventionally produced foods. For example, the largest table grape producer in the country produces an entirely organic crop, yet only 5 percent of his crop is sold as organic and fully 95 percent is sold through conventional markets at conventional prices. On the whole, however, organic producers are not prepared to supply a consistently available, competitively priced crop to the American public.

Nondetected residue systems or low-residue systems represent a transition step from conventional agriculture toward systems less dependent on synthetic chemical pesticides. Food grown with no detected residues is not an ultimate goal; rather, it is a way to eliminate the use of some pesticides, reduce the use of others and lower human exposure to pesticide residues in food.

Nondetected residue food does not solve all problems associated with pesticides. It does one thing well, however. A nondetected residue program provides people a way to shop their way to safer food by connecting consumers with the process of pesticide use reduction and rewarding farmers who use less pesticides. There are several examples of this operating in the marketplace, and since I see the light is on, I will speed up.

The two most well known, the Gerber program and the scientific certification systems nondetected residue food program have both been described here today. Basically what these programs prove is that safer food, food with less pesticides on it, can be produced, is being produced and made available to American consumers at competitive prices in abundant supply.

I will conclude with that and let the next witness proceed.

Mr. TOWNS. Thank you.

[The prepared statement of Mr. Wiles follows:]

ENVIRONMENTAL WORKING GROUP™

Testimony Before the
Subcommittee on Human Resources and Intergovernmental Relations

House Committee on Government Operations

Prepared by

Richard Wiles
Director, Agricultural Pollution Prevention Project
Environmental Working Group

July 27, 1993

Mr. Chairman, distinguished members of the Subcommittee. Thank you for the opportunity to testify today on the economic potential of food grown with less pesticides.

I am Richard Wiles, director of the agricultural pollution prevention project at the Environmental Working Group, a nonprofit environmental research organization here in Washington, DC.

This testimony proposes several ways that the federal government, through various purchasing programs and its general authority under the Federal Food Drug and Cosmetic Act, can create a market for fruits and vegetables certified to have very low levels of pesticides. Just as federal government purchasing has driven product innovation and created markets in other areas, a government market for low-residue fruits and vegetables will create rewards for farmers who use less pesticides, and will engage market forces in the implementation of the Administration's new commitment to pesticide use reduction and the promotion of sustainable agriculture.

Specifically, we propose a certified low pesticide residue purchasing standard and education campaign for the school lunch and breakfast program, the Head Start program, and the Defense Department food purchasing programs, and the creation of a national voluntary low residue standard for foods sold through commercial channels.

On June 28, 1993, the Environmental Working Group released the report *Pesticides in Children's Food*. This study presented the results of original analyses on the presence and risks from pesticides in the food supply, and along with a

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concurrent report from the National Academy of Sciences, resulted in a fundamental shift in national pesticide policy.

In releasing *Pesticides in Children's Food*, we went to great lengths to avoid a food scare and to assure the public that the food supply was generally safe. We were completely successful in that effort. At the same time our analysis makes it abundantly clear that to adequately protect young children from pesticides, the food supply must be made safer.

Our report broke new ground in several areas. First, we documented for the first time the prevalence of multiple residues in single foods, and showed that it is not uncommon for children to eat single pieces of fruits or vegetables with 5 or more pesticides on them. Second, we documented the severity and imbalance of pesticide exposure early in life, showing that up to 35 percent of lifetime exposure to some carcinogenic pesticides occurs by age 5. Third, we estimated the risk presented by this disproportionately heavy early exposure to eight carcinogenic pesticides routinely found in just 20 fruits and vegetables. The result is that for the average child, the EPA's "acceptable" lifetime level of risk is exceeded by age one.

Recent data from the USDA's Pesticide Data Program (PDP) confirms our results, finding up to 8 different pesticides on a single apple and multiple residues across the food supply. Our analysis of PDP data has given us a significant new insight to the way people are exposed to pesticides; when residues are found they are typically found in pairs. Fifty-eight percent of the PDP samples had detectable levels of pesticides, but the average sample with detectable residues had nearly two (1.8) pesticides on it. Meanwhile, the EPA assumes that people are exposed to pesticides in isolation, one pesticide at time.

The National Academy of Sciences report on *Pesticides in the Diets of Infants and Children* provides toxicological context to these findings. In essence, the Academy found the entire pesticide tolerance and regulatory system lacking, and particularly inadequate in protecting young children. The Academy concluded that "tolerances are not based primarily on health considerations" and that "the current regulatory system does not specifically consider infants and children." At the same time the Committee made clear that children need special protection, and that "in the absence of data to the contrary, there should be a presumption of greater toxicity to infants and children." The committee recommended that "the 10-fold factor traditionally used by EPA and FDA for fetal developmental toxicity should also be considered when there is evidence of postnatal developmental toxicity *and when data from toxicity testing relative to children are incomplete.*" They further cited the common occurrence of simultaneous exposures to different pesticides with the same toxic effect, and recommend accounting for multiple exposure in regulatory risk assessments.

Recognizing the seriousness of the issue and the failure of current policies, the Clinton Administration, in an historic announcement, proclaimed a new pesticide policy based on use-reduction and the promotion of sustainable agricultural practices. This policy was made possible by the welcome and unprecedented cooperation between the USDA, FDA, and the EPA. We are pleased that the Administration will look to our report, *Pesticides in Children's Food*, and the report from the National Academy of Sciences, *Pesticides in the Diets of Infants and Children*, in implementing this policy. To quote from the Administration's announcement:

> We expect to use the upcoming reports from the National Academy of Sciences and the Environmental Working Group on children and pesticides as a basis for formulating the legislative and regulatory policies needed to put the Administration principles into effect.

Now that we are committed to safer food, a central question ought to be: how can we achieve the goal of less pesticides in food in the most economically beneficial way?

The Current System

The current pesticide regulatory system is built on the notion of maximum acceptable risk. The goal is not to produce abundant and affordable food using the least amount of pesticides possible; rather it is to set and allow maximum acceptable levels of human and environmental exposure to hundreds of pesticides in thousands of formulated pesticide products applied to hundreds of food and feed crops. The foundation of this paradigm is the untenable notion that scientists and regulators can accurately assess the risks from residues of 20,000 different formulated pesticide products all interacting in the environment and the human body.

Not only is the basis of this process highly implausible, it is extremely expensive. It provides no incentives for agricultural production innovation, and maximum opportunities for delay. It is extremely bureaucratic, unpredictable, founded on misplaced burdens of proof, and divorced from market forces. It captures all of the bad elements of failed regulatory policies in other areas. It can be rightly characterized as "end of the pipe" regulation for food.

This process must be turned on its head. The Administration began this process on June 25th, but much more needs to be done. Legislative reform and improved food safety policies must occur within the following framework:

- All food production and pesticide regulatory policies should work coherently towards the same goal: producing food with the least amount of pesticides possible, and where appropriate and reasonable, no pesticides at all.

- This goal should be accomplished at the least cost to taxpayers, consumers, and farmers, where feasible harnessing market forces in the process of use reduction and elimination of the most hazardous pesticides.

Within this framework, certain specific policy changes must be made.

- Pesticides that pose unacceptable risks to children must be phased out.

- Pesticides that remain on the market must meet strict health-based criteria designed specifically to protect children and other sensitive or highly exposed groups.

- USDA must embark on an initiative to provide pest control alternatives to growers of crops most dependent on pesticides that present the greatest risks to human health and the environment.

- Consistent and enforceable market incentives that reward growers for reduced and low pesticide use, must be established.

Safer Food, Why Ignore the Opportunities?

Safer food is often presented as an either/or paradigm. Either we can continue with today's abundant affordable food supply, or we can have safer food that looks terrible, costs twice as much, and is not consistently available. This is, of course, a false dichotomy that only serves the interests of those who wish to continue current levels of pesticide use and to deny consumers expanded choices in the marketplace.

Safer food is being delivered to some consumers right now, at competitive prices, in abundant supply, and of the highest quality. Two such programs will be discussed below, but first let me describe several economic realities of pesticide use in American agriculture.

First, most farmers use more pesticides than they need. This occurs for a number of reasons. There are no regulatory or market mechanisms forcing maximum efficiency in pesticide use. Regulations encourage use up to maximum levels, and give no advice regarding the effectiveness of pesticides at anything less than the maximum rate. The majority of farmers receive pest control advice from pesticide dealers and salesman, who also have little incentive to encourage reduced use. There is no coherent research and demonstration program at the USDA designed to help farmers use less pesticides. Pesticides are like insurance; they are a relatively minor percentage of overall production expenses, but at the same time substantially reduce economic risk. In the absence of regulatory action and clear market rewards, and with no pressure to account for the environmental and health consequences of pesticide use, farmers will continue to use the same or more pesticides than they always have.

Second, and of direct bearing on the subject of today's hearing, changes in pesticide use on the farm has almost no impact on consumer prices.

- Pesticides are a small portion of overall farm operating expenses. Nationwide, pesticides account for about 4 percent of overall farm production expenses[1]. Changes in pest control costs, therefore, have a marginal effect on overall profitability and even less effect on consumer prices.

- Middle men and marketers control consumer prices. Modest costs increases or decreases in any farm input rarely effect the price of food. This is largely because processing, packaging, transportation, and advertising claim about three quarters of consumer food expenditures, leaving farmers, on average, with about 25 cents of every food dollar spent in the supermarket[2]. The four percent of total production costs accounted for by pesticides, amount to one percent of the price consumers pay for food.

- There are scores of alternative pesticides and pest control methods. About 25 major pesticides have been removed from the market in the past 15 years. In no case did the cancellation of a pesticide result in significant crop losses or food price increases for consumers. In fact, the average U.S. citizen continues to spend less of his or her disposable income for food than in any other industrialized nation.

<u>The Need for Legislative Reform</u>

Before discussing the need for and benefits of market incentives, let me first make clear the need for legislative reform. Market incentives will not provide adequate protection of the public health in the absence of sound federal pesticide policies.

Beyond the Delaney clause, which has yet to be thoroughly enforced, federal pesticide law lacks a clear public health mandate. The health consequences of this failure may be severe and are borne disproportionately by population subgroups with special exposure or sensitivities, such as farm workers or children. One bill, H.R. 872, sponsored by Mr. Waxman, and its companion bill, S. 331, sponsored by Mr. Kennedy, provides for strict reforms to the current regulatory system that will begin to guarantee adequate public health protection from pesticides in the food supply. Within such a regulatory environment,

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[1] U.S. Department of Agriculture, Economic Research Service. Agricultural Outlook. Vol. 197, June 1993, table 33.

[2] U.S. Department of Agriculture, Economic Research Service. Agricultural Outlook. Vol. 197, June 1993, table 8.

market incentives could accelerate pesticide use reduction, encourage pest management innovation, and reward farmers who use less pesticides.

There are three basic options for consumers in the marketplace: organically grown food, food certified to have no detectable residues, and conventionally grown food. Two of these, organic and non detected residue food, provide safer food to consumers.

Most of agriculture today is based on conventional production technology. These techniques are very high-yielding, but are dependent on petroleum-based synthetic chemical inputs and a set of practices that present unreasonable risks to the environment and human health.

Organic Food Production Systems

The long term goal of American agriculture should be the widespread adoption of production systems based on the practices used by organic producers today. These systems are the most sophisticated, require the most knowledge, and will ultimately produce food at the least total cost, with the least risks to the environment and public health. We are, however, a long way from being able to reap the benefits of an organic oriented food production and distribution system.

Organic production avoids off farm purchased inputs wherever possible. Organic food is produced with no synthetic chemical pesticides, fertilizers, or growth hormones, and no prophylactic use of animal antibiotics. Organic producers use a combination of practices that capture nutrients and pest control benefits from the crops they grow and the way they grow them. Organic producers convert sunlight into nitrogen through production of legumes, they control weeds through crop rotation and mechanical means like cultivation. They provide additional nutrients to crops through the use of compost that builds the soil and produces healthier plants better able to resist pests and disease. Organic growers compliment these practices with traditional biological pest control methods such as the releases of predatory insects or the use of resistant crop varieties. In sum, they work to capitalize on the natural forces available to them on the farm.

In some cases organic crops are currently competitive with conventionally produced food. For example, the largest table grape producer in the country produces an entirely organic crop. Only five percent of this crop is sold as organic, and fully 95 percent is sold through conventional markets at conventional prices. On the whole, however, organic producers are not yet prepared to supply a consistently available competitively priced crop to the American public.

This is true for one simple reason; organic producers are on their own; they receive essentially no help from the government. Organic farmers truly

exemplify the entrepreneurial spirit of innovation held in such high esteem in the agricultural community. For example, conventional farmers have received well over one billion dollars of research support per year for the past ten years, and hundreds of millions of dollars per year for the 40 years prior to that. Organic producers receive essentially no government research support, yet their market and productivity continues to grow.

Non Detected Residue Food

Non-detected residue systems represent a transition step from conventional agriculture towards systems less dependent on synthetic chemical pesticides. Food grown with no detected residues (NDR) is not an ultimate goal; rather it is a way to eliminate the use of some pesticides, reduce the use of others, and lower human exposure to pesticide residues in food. Food produced to meet an NDR standard does not solve all problems associated with pesticides. It does one simple thing, and it does it well; an NDR program provides people a way to shop their way to safer food by connecting consumers with the process of pesticide use reduction and rewarding farmers who use less pesticides.

Several major players in the mainstream food industry have adopted the NDR standard as a staple. The examples I will discuss today are Gerber Baby Food, and The Scientific Certification Systems NutriClean program employed by three mainstream west coast supermarkets, Ralph's, Raley's, and Fred Myers. These programs prove that it is possible for mainstream agriculture and high volume name brand producers to provide consistent, high quality, affordable food, with very much reduced pesticide residue levels.

The Public Health Benefits of NDR Food

NDR food is safer food, and it provides the consumer with certainty as to the pesticide residues present when the food is purchased. The Scientific Certification Systems (SCS) NutriClean program certifies food to have no detectable pesticide residues above 0.05 parts per million - the level considered by many chemists to represent the FDA practical limit of detection for most pesticides. The Gerber system guarantees no detected residues at different levels depending on the pesticide, but all levels are equal to or lower than the 0.05 ppm standard used by Scientific Certification Systems.

Reducing food residues to levels below 0.05 ppm represents a substantial reduction in dietary exposure to pesticides. The Environmental Working Group recently quantified the magnitude of this reduction by analyzing recent residue data from the USDA Pesticide Data Program, for pesticides on ten fruits and vegetables. This data set is unique because residues are quantified down to a very low level of 1 part per billion, where technology allows, permitting a reasonable comparison of the residue levels above and below the 0.05 ppb standard.

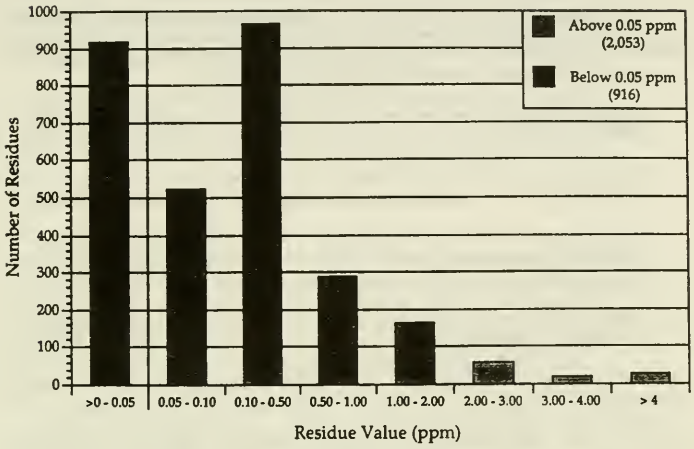
We found that when residues are detected (in this case 58 percent of the samples) approximately 70 percent of all detected residues are above 0.05 ppm (figure 1). Thus, lowering residues to meet the NDR standard represents a real improvement in public health protection. At the same time, nearly 90 percent the residues over 0.05 ppm are less than 1 ppm, meaning that achieving the 0.05 standard is probably within reach for most growers.

How the NDR System Works

The Scientific Certification Systems NDR program works as follows. Growers enter into a contract with certifiers and retailers to produce a crop with no detectable residues of any pesticide at 0.05 parts per million. This level (0.05

Figure 1

Pesticide Residues in Ten Fruits and Vegetables Above and Below 0.05 Parts Per Million
January - June 1992*



* 0.05 ppm is the level proposed for a federal low residue standard. This figure shows that about 70% of detectable residues for ten fruits and vegetables currently fall above 0.05 ppm proposed standard.

** The following ten fruits and vegetables were tested, 2,969 residues were found: Apples (309 samples, 517 residues), Bananas (311 samples, 72 residues), Celery (259, 398), Green Beans (238, 321), Grapefruit(310, 137), Grapes(297, 510), Lettuce(310, 151), Oranges (311, 215), Peaches (205, 344) and Potatoes (309, 304).

Source: Environmental Working Group. Compiled from US Department of Agriculture, Agricultural Marketing Service, Pesticide Data Program, January-June 1992.

ppm) is considered to be the practical limit of detection for most pesticides. To certify that the crop meets the NDR standard, farmers agree to provide records of all pesticides used to produce the crop (rates and dates). Produce is then tested for pesticides that are applied as well as those that were prohibited. If no residues are detected above 0.05 ppm the crop may be sold as NDR food.

Growers achieve the NDR standard by eliminating some pesticides and reducing the use of others, particularly late season and post harvest applications. They increase the use of biological pest control, and pay more attention to their pest management practices. For example, to achieve the current NDR standard:

- Pear and apple producers have greatly reduced or eliminated the insecticide guthion, and replaced it a pheromone mating disruption technique.
- Potato growers eliminated applications of sprout inhibitors chloropropham and maleic hydrazide, and vastly reduced applications of the EBDC fungicides.
- NDR grape producers have substituted predatory insect and mite releases for insecticides, eliminated fungicide application at bloom, and achieved disease control through the use of sulfur and pruning to achieve better air flow.
- Celery growers have changed irrigation techniques to control disease, and have used predatory insect releases.

The driving force behind the switch to NDR production systems is a slight premium that retailers pay to growers for crops that they market as NDR. On average, however, this premium translates to just one penny per pound at retail. Typically, retailers market NDR produce at prices equivalent to conventional produce. About 350 mainstream supermarkets (primarily three chains, Ralph's, Raley's, and Fred Myers) have sold NDR produce in California, Oregon and Washington for the past five to seven years. Last week, there were 20 different NDR fresh produce items available in these three chains.

Gerber

The entire Gerber baby food product line is produced to a standard of no detectable pesticide residues. Tight specifications on residue levels in the final baby food product are considered part of the overall quality of Gerber baby food. The pesticide residue levels enforced by Gerber are far below the levels allowed by the federal government for most pesticides.

The Gerber program differs from the SCS program, largely because Gerber, as a food processor and a corporation with high name brand recognition, has different relationships with growers. The Gerber program may have less impact on pesticide use, however, because Gerber relies on processing to reduce residues of some

pesticides, and because Gerber is measuring residues in finished product, whereas the SCS program measures fresh produce at harvest.

Even so, Gerber has eliminated some major pesticides from some of the crops it buys and placed tight use restrictions on others. For example, the fungicide benomyl and the EBDC class of fungicides are not allowed on some crops, and the interval between last application and harvest is increased for others. The insecticides diazinon and carbaryl are not allowed for use on most crops, and tight restrictions are placed on the few crops where they are allowed.

While the Gerber program does not address many other important issues with pesticides, the program proves that a proactive safer food program is a practical goal for major food companies, and that eliminating the use of certain pesticides is feasible and has no impact on the availability and price of the final food product.

A Low Residue Standard for Government Purchasing of Food

Based on the clear public health benefits of what is now sold as certified non-detected residue fruits and vegetables, the feasibility of producing such food, and the ultimate environmental, economic, and health benefits of agricultural production systems that rely less on pesticides, including organic production systems, we recommend the immediate implementation of pilot purchasing programs for low residue food modeled after current non detected residue programs, for all major federal food purchasing programs including the school lunch and breakfast programs, the Head Start program, the Department of Defense food purchasing programs, and other major government food purchasing programs.

Encouraging Low Residue Production Systems Through Legislation
We further recommend the creation of a *voluntary* national standard for low residue or non-detected residue food in the Food Drug and Cosmetic Act (FDCA). This would legitimize and standardize the concept of certified low food and provide much needed incentives for other growers, supermarkets, and certifying firms to enter the business.

Components of certified low residue food policy include the following:

- A voluntary low residue certification standard in the FDCA that would allow market claims to be made by growers and retailers who produce and sell food that meets the standard. The standard would be set at 0.05 pp., to be modified in the future based on improvements in analytical chemistry and pest management. Low residue claims would not be allowed when federal tolerances are below the low benchmark.

- Sampling strategies designed to detect the maximum residue, adopting currently accepted sampling methods. The low residue standard would apply to residues at harvest or immediately after any post harvest application.

- Full public disclosure of pest control practices, testing methods and results. Growers and certifiers would be required to keep records of all pesticide applications to low residue food for at least three years. Certifying companies and contract labs would be required to keep records of sampling methodologies, analytical test methods and results for at least three years. Records for pesticide use, sampling methods, analytical chemistry, and results would be reported by certifying companies to the appropriate state and federal authorities each year. These reports would available to the public upon request in electronic or print form (with no conditions).

- Testing only at FDA certified labs. The FDA is currently finalizing a residue chemistry lab accreditation program that could serve as the basis for lab certification.

Summary

Safer food is currently available in limited portions of the domestic marketplace. The existence of this food makes it abundantly clear that where there is a market, growers can produce affordable food with greatly reduced levels of pesticides, or no pesticides on it. The question is not can we provide safer food at competitive prices; it is already being done. The question is are we displaying the leadership and wisdom to refine and expand these programs so that their benefits will be more widely available.

We look forward to working with you, Mr. Chairman, and the members of the subcommittee to implement market mechanisms that will accelerate the broad availability of even safer food in the mainstream American food supply.

Thank you.

Mr. TOWNS. Dr. Goldburg.

STATEMENT OF REBECCA J. GOLDBURG, PH.D., ENVIRONMENTAL DEFENSE FUND

Dr. GOLDBURG. Thank you. On behalf of the Environmental Defense Fund, I thank you for the opportunity to testify today. I will focus on the reasons why biotechnology is not the key to developing alternative agricultural systems. I will also discuss the safety of the primary products of agricultural biotechnology—food derived from genetically engineered crop plants. I will explain why FDA's current policy for genetically engineered crops does more to protect the biotechnology industry than to protect consumers.

First, some proponents of biotechnology have long touted this field as the solution to environmental problems caused by agricultural chemicals. Despite these claims, the limited types of agricultural biotechnology products now under development will not lead to dramatic reductions in pesticide use.

Scientists are now only able to use the techniques of modern biotechnology to modify organisms in limited ways. The vast majority of organisms that have been genetically engineered are crop plants, and about 23 percent are engineered to resist viruses to resist certain caterpillars or beetles. These plants may lead to reductions of applications of particular pesticides on particular crops in particular situations.

About 56 percent of field trials of genetically engineered crop plants have been of crops modified to tolerate applications of herbicides or chemical weed killers. These genetically engineered crops are being engineered specifically to be used with chemical pesticides, not to substitute for them. These new biotechnology products will not lead to the changes in agricultural practices needed to widely implement alternative agriculture.

Alternative agricultural systems emphasize farm management and are designed to integrate agricultural systems with natural processes. In contrast, spurred by patent rights, the major thrust of applied research in agricultural biotechnology is the development of new products. Although some of these products may eventually become useful components of alternative agricultural systems, they are not going to lead farmers from conventional to alternative agriculture; rather, the transition to alternative agriculture will largely be based on innovative combinations of agricultural practices.

Unfortunately, as you have heard from a number of other witnesses, the U.S. Government, and USDA in particular, has neglected research and development on alternative agricultural systems.

Second, I would like to briefly alert the subcommittee to another food safety issue apart from that of residues of conventional pesticides in food. This issue is the safety and regulation of foods derived from genetically engineered crop plants.

To consumers, genetic engineering means that a virtually limitless number of genetic encoded substances, many of which have not been traditionally part of the human diet, can now be added to organisms used as food. Consider the potato. Traditional breeders can cross one potato with another. In contrast, genetic engineers have now field-tested potatoes containing genetic material from chick-

ens, moths, peas, soybeans, viruses, and bacteria. Because genes encode proteins, each of these potatoes contains a new protein normally found in another species.

In some cases, these new proteins might pose hazards. Of most obvious concern, crops engineered to be toxic to insects and other pests clearly have the potential to be toxic to humans.

Genetic engineering could also cause susceptible individuals to become allergic to foods they previously could safely consume. Why is this? All known food allergens are proteins; thus novel proteins transferred via genetic engineering into food crops could sometimes make food become newly allergenic.

Although they don't receive top billing, food allergies are a very serious public concern. Some allergists estimate that more children die every year from allergic reactions to food than to insect stings.

Unfortunately, the FDA has chosen to address concerns raised by genetically engineered food with a weak policy, which was announced by former Vice President Dan Quayle in May 1992 as regulatory relief for the biotechnology industry. As detailed in my written testimony, FDA's policy appears to give producers of genetically engineered food enormous discretion about whether to approach the agency about the safety of genetically encoded substances added to foods.

In addition, FDA will only require labeling of genetically engineered food under exceptional circumstances. Consumers will have little right to know what they are buying.

In short, FDA's policy appears to provide the biotechnology industry with new discretion to make self-determinations about the safety and labeling of genetically engineered foods. Especially in the wake of breast implant manfacturers' multiyear failure to even disclose the serious risks of their products, consumers of genetically engineered foods can hardly feel reassured by FDA's expanded reliance on industry self-monitoring.

Thank you.

Mr. TOWNS. Thank you.

[The prepared statement of Ms. Goldburg follows:]

INTRODUCTION

On behalf of the Environmental Defense Fund (EDF), I thank the subcommittee for the opportunity to testify today on how biotechnology will affect the development of alternative agriculture and the safety of the food supply. EDF is a nationwide non-profit environmental research and advocacy organization with a twenty-five year history and over 200,000 members. Six years ago EDF established a Biotechnology Program to engender the responsible development of modern biotechnology. As the biologist heading EDF's Biotechnology program, I have been extensively involved in issues dealing with the goals of genetic engineering research and with the regulation of biotechnology products.

In my testimony I will focus on the reasons why agricultural biotechnology is not the key to developing "alternative agriculture" -- environmentally compatible agricultural systems that would, among other things, lessen farmers' dependence on synthetic chemical pesticides. I will explain why, although biotechnology may provide some tools and products that prove useful in alternative agriculture, biotechnology alone will not bring about a fundamental shift in agricultural practices. I will also discuss the safety of the primary products of agricultural biotechnology -- foods derived from genetically engineered crops. I will argue that the federal Food and Drug Administration's (FDA's) current policy for regulation and labeling of genetically engineered foods does more to protect the biotechnology industry than to protect consumers.

I will use the term "biotechnology" to mean the application of modern techniques for genetic manipulation, such as recombinant DNA. These techniques allow scientists to alter the genetic makeup of organisms in ways not possible with selective breeding -- the primary traditional method for genetically manipulating crops, livestock, and other organisms. Breeders are limited to manipulating the genetically encoded traits of organisms that can interbreed, which must be from the same or closely related species. In contrast, genetic engineers can potentially shift genetic material from one species to any other species. Various other special manipulations of genetic material, such as gene deletions and laboratory gene synthesis, are also possible with modern genetic techniques.

BIOTECHNOLOGY IS NOT THE KEY TO ALTERNATIVE AGRICULTURE

Some proponents of biotechnology have for the past decade touted this field as the solution to a number of pressing agricultural problems, including environmental problems caused by agricultural chemicals. The products of agricultural biotechnology would, so they said, soon provide substitutes for many hazardous agricultural chemicals. Use of these chemicals would be greatly reduced, if not eliminated.

Similar promises for agricultural biotechnology continue to this day. In a June 1993 letter published by the New York Times, the head of the Biotechnology Industry Organization, Carl Feldbaum, wrote that "Biotechnology companies . . . are producing more nutritious foods that require a fraction of the fertilizers, pesticides and herbicides used on conventional crops." (Feldbaum did not mention that no genetically engineered crop has yet been commercialized.)

Despite such claims, there are two major reasons why biotechnology is not a panacea for agriculture's environmental problems. First, agricultural biotechnology is limited in what it can accomplish, and the major products under development will not lead to dramatic reductions in pesticide use. Second, biotechnology researchers are in large part focusing on developing new, patentable and potentially profitable products. Although some of these products may become components of alternative agricultural systems, they will not directly promote the adoption of alternative agriculture.

Another point worth noting is that the releases of genetically engineered organisms intended for use in agriculture may pose their own ecological risks. In the interest of brevity, I will not in my testimony today detail these ecological risks, nor the inadequacy of federal oversight of releases of genetically engineered organisms.

<u>The limited types of agricultural biotechnology products now under development will not lead to dramatic reductions in pesticide use.</u>

Scientists are now only able to use the techniques of modern biotechnology to modify organisms in limited ways. The genetic makeup of most organisms is poorly known and genetic systems are dynamic and complex. Most current changes to organisms are additions or modifications of a single gene that encodes an economically valuable trait. Most economically valuable traits are, however, encoded by a large number of genes. For example, some scientists have spoken of modifying crops to make their own fertilizer by "fixing nitrogen" or to require less water by resisting drought. But nitrogen "fixation" and drought resistance are traits controlled by many genes, and thus biotechnology can not be used to confer these traits to crops in the foreseeable future.

What, then, is being accomplished with agricultural biotechnology? Crop plants comprise the vast majority of organisms that have been genetically engineered. As of April 1993, federal agencies had reviewed roughly 550 submissions for field tests of genetically engineered organisms, 493 of them for genetically engineered crops. All but two of the other submissions were for genetically engineered microorganisms -- mostly microbial insecticides.

The majority of genetically engineered crop plants are being altered in just a few ways. As of the end of 1992, 57 percent of all approvals for field

trials of genetically engineered plants in countries belonging to the Organization for Economic Cooperation and Development (OECD) were for crops genetically engineered to tolerate applications of synthetic chemical herbicides (weed killers). (The OECD's members are 14 highly industrialized countries, including the United States.) The other two other major categories of approvals were for resistance to plant viruses (13%) and resistance to certain caterpillars and beetles (10%).

This relatively limited array of product types will not lead to dramatic reductions in pesticide use in the near future, and in some cases may exacerbate pesticide use. Plants genetically engineered to resist particular insect pests may lead to reductions in the application of particular insecticides on particular crops. However, even if these engineered crops are widely purchased by farmers and they effectively control the intended insect pests, farmers will still likely routinely use insecticides to control other insect pests. Corn, for example, is being genetically engineered to control European corn borers. Most insecticide now applied to corn, however, is used to control other pests.

Virus-resistant plants will not directly affect pesticide use, since "viricides" are not now applied to plants. However, virus-resistant crops may lead to some reduction in insecticide use since these chemicals are sometimes used to control aphids that are vectors of plant disease.

Herbicide-tolerant plants -- the majority of genetically engineered plants under development -- are being designed specifically to be used with chemical pesticides. Herbicides comprise about 60 percent of all pesticides used in United States agriculture (by weight of active ingredients), and there is enormous market incentive for agrichemical companies, or affiliated seed companies, to develop crops that tolerate herbicides that they manufacture. At least nineteen companies, along with government-funded researchers, have field tested genetically engineered herbicide-tolerant crops in the United States.

Proponents of herbicide-tolerant crops argue that these plants are being modified to tolerate new herbicides which are environmentally safer than hazardous older chemicals now used on these crops. They argue that herbicide-tolerant plants will therefore allow farmers to substitute less hazardous for more hazardous chemicals. Of course, whether this happens will depend on the degree to which farmers actually substitute the newer chemicals, rather than use them as a backup for older chemicals.

Herbicide-tolerant plants are also being developed to tolerate some of the older, hazardous herbicides -- such as 2,4-D -- as well as the newer, supposedly safer herbicides. Use of these plants will almost certainly promote environmental degradation. And, all herbicide-tolerant plants, no matter what type of herbicide they tolerate, will entrench agriculture's reliance on weed control pesticides.

A handful of genetically engineered microbial insecticides -- genetically engineered bacteria and viruses that kill insects -- are also under development. (One genetically engineered bacterium, which is killed before it is sold, is already on the market.) Although these engineered insecticides may be safer than chemical insecticides, in some instances they may not be as environmentally benign as naturally occurring microbial insecticides. This is because genetic engineering is in many instances being applied to overcome the "defects" of naturally insecticidal microorganisms, such as their limited host range, kill rate, and persistence. Changing these traits to make microorganisms more toxic over longer periods of time to wider varieties of pests will make them more like traditional chemical insecticides.

Even if they bring some environmental advantages, all the biotechnology products discussed above are susceptible to a major bugaboo of traditional chemical pesticides -- the propensity of pests to evolve resistance to pesticides to which they are repeatedly exposed. Thus it is likely that with widespread use, some or even most of the pest-resistant plants, herbicide-tolerant plants, and microbial insecticides now under development will become useless, because target pests will evolve to tolerate them.

New biotechnology products will not lead to the changes in agricultural practices needed to widely implement alternative agriculture.

Alternative agricultural systems are designed to minimize harm to natural ecosystems and human health and to maintain farm productivity and farm income for years to come. These systems, which emphasize farm management, are designed to integrate agricultural products and practices with natural processes. Farmers may in some years plant crops such as alfalfa that increase soil nitrogen, and thus reduce the need for chemical fertilizers in subsequent years. Farmers may time the planting of crops so that they can emerge from the soil before competing weeds, thus avoiding herbicide applications. Farmers may scout crops for insect pests, and only apply insecticides if pest populations have reached a threshold where they will cause economic damage.

In contrast, spurred by the application of patent rights to genetic engineering, the major thrust of applied research in agricultural biotechnology research has been the development of new products. Some of these products, such as virus-resistant plants, may eventually prove useful components of alternative agricultural systems. A few new products, however, are not themselves sufficient to lead farmers from conventional to alternative agriculture. Rather the transition to alternative agriculture will be largely based on innovative combinations of agricultural practices.

Recommendations

To promote innovations that will contribute to alternative agriculture, federally funded agricultural research should place much higher priority on farming systems research and extension, rather than product development. In the past two decades, while United States Department of Agriculture (USDA) funding for agricultural biotechnology research has increased dramatically from almost nothing to about $170 million per year, government support for applied research and extension in farming systems has not even kept pace with inflation. This imbalance in priorities stymies the development of alternative agriculture.

Moreover, in some instances federal agricultural research is largely misdirected. In 1989, USDA's Joint Committee on Food and Agricultural Sciences declared development of herbicide-tolerant plants a research priority. By various estimates, in recent years USDA has been funding from about 20 to 60 projects a year involving the development of herbicide-tolerant plants. At the same time, as companies have demonstrated by their choices of research products, there is a clear profit-incentive for companies to develop plants that tolerate herbicides they manufacture.

Public sector researchers should not be trying to duplicate this private sector effort, especially since herbicide-tolerant plants will only continue agriculture's pesticide-dependence. Instead, taxpayer-supported researchers should focus on developing weed control practices and products that are not profitable for the private sector to develop, but are potentially beneficial to farmers and society at large.

FDA IS NOT PREPARED TO ASSURE THE SAFETY OF GENETICALLY ENGINEERED FOODS

In order for genetically engineered crop plants to be successful in the marketplace, consumers must in the near future buy genetically engineered foods derived from these plants. One company, Davis, California-based Calgene, Inc., has already approached the Food and Drug Administration (FDA) to commercialize genetically engineered tomatoes.

Some genetically engineered foods may present risks to consumers.

To consumers, genetic engineering means that a virtually limitless number of genetically encoded substances, many of which have not been traditionally part of the human diet, can now be added to organisms used as food. Consider the potato. Traditional potato breeders can only cross one potato variety with another, or with wild potatoes closely related to cultivated potatoes. Genetic engineers, on the other hand, have now field-tested in the United States potatoes containing genetic material from a long menu that includes chickens, giant silk moths, greater wax moths, peas, soybeans, viruses, and bacteria. Because genes encode proteins -- the biochemical that are the

building blocks of cells -- each of these potatoes contains a new protein usually found in another species.

Most proteins added through genetic engineering are unlikely to harm consumers; no food manufacturer adds substances to the food supply with the intention of harming people. Nevertheless, in some cases new proteins could pose hazards. Of most obvious concern, crops engineered to produce proteins toxic to insects and other pests clearly have the potential to be toxic to humans.

Genetic engineering could also cause susceptible individuals to become allergic to foods they previously could safely consume. All known food allergens are proteins. Novel proteins transferred via genetic engineering from an allergenic food organism could sometimes cause the recipient crop to become newly allergenic. In addition, proteins that have no history of human consumption (e.g. certain insect proteins) could turn out to be allergenic when food crops are genetically engineered to produce them.

Food allergies are a serious public health concern. Roughly one to two percent of the United States population, and four to six percent of children, suffer from true food allergies mediated by the immune system. (Many more people have food sensitivities, such as headaches in response to caffeine consumption, that are not mediated by the immune system.) Food allergies can cause anaphylactic shock -- a severe, sometimes fatal allergic reaction that can involve breathing difficulty, blood pressure loss, and unconsciousness -- as well as discomforts such as rashes and gastrointestinal distress. Some allergists estimate that more children die every year from allergic reactions to food than reactions to insect stings.

Unfortunately, FDA has chosen to address the concerns raised by genetically engineered foods with a weak policy, announced by former Vice President Dan Quayle in May 1992 as regulatory relief for the biotechnology industry. This policy sidesteps existing law that requires rigorous safety screening and ignores existing food labeling regulations.

FDA's policy gives industry new discretion when to approach FDA about food safety.

Under the 1958 Food Additives Amendment (FAA) to the Food, Drug, and Cosmetic Act the burden of proof falls squarely on industry to demonstrate the safety of new substances added to food. Genetically encoded substances added through genetic engineering techniques that are a component of food, or that otherwise affect the characteristics of food, fall squarely under the FAA. FDA, at least in principle, appears to agree with this conclusion. The manner in which FDA has chosen to apply the FAA to genetically encoded substances is not, however, good news for consumers.

Under the FAA, no new substance added to food can be sold to the public unless the food manufacturer obtains FDA's advance safety approval or can show a broadly accepted scientific basis for concluding that the substance is safe for human consumption. To comply with the FAA, a food manufacturer must either a) submit a food additive petition to FDA for approval, or b) determine that the substance is "generally recognized as safe" (GRAS) among qualified experts. Under the second option, manufacturers may unilaterally decide particular substances are GRAS, or they may petition FDA voluntarily to affirm the GRAS status of added substances. To be GRAS, a substance must have been used in food prior to January 1, 1958, and have been demonstrated to be safe when used as intended.

FDA's new policy appears to have substantially loosened the definition of GRAS to make it easier for producers of food containing new substances added through genetic engineering to avoid having to obtain approval of food additive petitions. FDA's policy includes a number of decision trees, flow charts of yes-no questions. By answering a series of questions such as "Is there any reported toxicity, or does the biological function raise any safety concern?" food producers are supposed to decide whether they need to consult FDA before they market foods obtained from genetically engineered crops.

FDA's decision trees appear to allow producers to elect not to petition FDA for food additive approval, even if they cannot meet the agency's traditional tough requirements for establishing that a food substance is GRAS. In fact, FDA's policy states that the agency will only require food additive petitions "in cases where safety questions exist sufficient to warrant formal pre-market review by FDA to ensure public health protection." This statement amounts to a new definition of GRAS which hands industry expanded discretion to decide whether foods are safe enough to sell to consumers.

FDA's policy only requires labeling of genetically engineered foods under exceptional circumstances.

Federal law requires food producers to include on food labels "material" facts -- generally info nation that consumers perceive as important. FDA's policy only provides one example, however, in which labeling of genetically engineered foods would be required. In the case of a tomato with an introduced peanut protein that had not been demonstrated not to be an allergen, a label would be required to alert allergic individuals to avoid the food. This labeling requirement appears too narrowly defined, however. It applies only to proteins transferred from "commonly" allergenic foods. Consumers who may be allergic to proteins transferred from less commonly allergenic foods are not protected.

Other types of information about genetically engineered foods that may be material to consumers receive little mention. FDA's policy states that consumers must be informed if a genetically engineered food "differs from its

traditional counterpart such that the common or usual name no longer applies to the new food," but it is unclear how FDA will apply this statement. The policy never discusses whether vegetarians and individuals who follow religious dietary laws may be troubled by genetically engineered foods that contain genes transferred from animals.

Very troubling, FDA's policy completely ignores well-established regulations for labeling of food ingredients. Foods "fabricated" from two or more ingredients must, with certain exceptions, carry a label disclosing the ingredients by their common or usual names. FDA regulations mandate, for example, that companies disclose on labels the salt and sweeteners added to canned corn not because FDA believes these ingredients are hazardous, but because consumers have a right to know what they are purchasing. Consumers similarly have a right to know about genetically encoded substances added to foods. For example, suppose a gene encoding a proteinaceous sweetener were added to corn plants. FDA would be inconsistent not to require labeling of the sweetened corn.

FDA has received more than 3500 letters concerning the agency's policy on genetically engineered food, the vast majority of them from angry consumers who want better labeling of genetically engineered foods. FDA has responded by publishing a *Federal Register* notice in April 1993 requesting further comment on labeling of genetically engineered foods.

Conclusion

FDA's policy appears to provide the biotechnology industry with new discretion to make self-determinations about the safety and labeling of genetically engineered foods. In the wake of breast-implant manufacturers' multi-year failure to even to disclose to the public the serious risks of their products, consumers of genetically engineered foods can hardly feel reassured by FDA's expanded reliance on industry self-monitoring.

Mr. TOWNS. Dr. Schaller.

STATEMENT OF DR. NEILL SCHALLER, ASSOCIATE DIRECTOR, HENRY A. WALLACE INSTITUTE FOR ALTERNATIVE AGRICULTURE

Mr. SCHALLER. Thank you, Mr. Chairman. Much has been said here this morning and I will try to be brief.

I am Neill Schaller, associate director of the Henry A. Wallace Institute for Alternative Agriculture. We are a private nonprofit organization dedicated to increasing awareness, understanding, and adoption of what has come to be called a sustainable agriculture.

In my view, clearly the issue is not whether it is necessary to reduce the use of pesticides, but how it can be done effectively, fairly, and with minimal adverse effects.

Is it feasible to reduce pesticides on farms? Yes, it is. Much new research is underway to try to answer the question of how to do this. A small but highly visible USDA program mentioned here several times, the Sustainable Agriculture Research and Education Program, is setting a good example. It is pathetically underfunded. The Government can do a great deal to enhance sustainable agriculture by supporting this small program.

What the results of this work are telling us so far is that for many farmers there are potential, and in many cases proven, alternatives to extensive use of pesticides; that neither food output nor farm income needs to suffer if they are adopted; and that the benefits of these alternatives can be expected to increase over time as farmers gain experience using them. The learning process has begun, but it needs Government support.

As for impacts on consumers, the health, safety, and food quality benefits of reducing pesticide use can be achieved without increasing the price of food—if we put our minds to it. We know a lot about how food prices are determined. It seems to me there are obvious things that we need to recognize.

One is how important, or unimportant, the farm product is in the final food product the consumer buys in the store. A USDA report issued this year points out that, for example, grain accounts for only 5 percent of the price of a loaf of bread. The farm value of many fruits and vegetables ranges from 10 to 40 percent of the retail price. What these figures mean is that even if reduced pesticide use on farms were to increase farm production costs per unit, which are then passed on to consumers, the effect on the final price of many foods would be far less significant than the farm level change might otherwise indicate.

Food prices can be influenced greatly by what happens after food leaves the farm gate. Dr. Stewart Smith, who was recently a senior economist with the Joint Economic Committee of the Congress, has calculated that between 1910 and 1990, as activities once performed by farmers were shifted to nonfarm firms, the farm sector's share of the total economic value added to agricultural products declined from 41 to 9 percent. Meanwhile, the input sector share rose from 15 to 24 percent, and the marketing sector share went from 44 to 67.

This means that if we want to understand and monitor the impacts of reduced pesticide use on food prices, we have to look not

only at the overall demand-supply picture, and what happens on farms, but also, and especially, at the behavior of the rest of the food system.

For now, based on what we know today, I don't expect wise reductions in the use of pesticides to increase food prices. Banning pesticides completely probably would, but I don't think that is the option considered here today.

I believe that pesticide reductions promise innumerable benefits, including the possibility of lower food prices in the future. Therefore, I see the advantages of moving in the direction of reduced pesticide use as inescapable.

Thank you.

Mr. TOWNS. Thank you very much for your testimony.

[The prepared statement of Mr. Schaller follows:]

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STATEMENT OF

Dr. Neill Schaller
Associate Director
Henry A. Wallace Institute for Alternative Agriculture

TO THE

Subcommittee on Human Resources and
Intergovernmental Relations of the
House Committee on Government Operations

ON

"Safer Foods for America: At What Cost?"

July 27, 1993

MR. CHAIRMAN and MEMBERS OF THE SUBCOMMITTEE:

I am Neill Schaller, Associate Director of the Henry A. Wallace Institute for Alternative Agriculture, located in Greenbelt, Maryland. We are a private, nonprofit organization dedicated to increasing the awareness, understanding, and adoption of resource-conserving, environmentally sound, economically viable, and otherwise sustainable farming systems. Our Board of Directors includes farmers, scientists, educators, representatives of environmental and consumer interests, and business leaders. While I speak for the Institute's Board and staff, the following remarks are my own.

The Institute commends the Subcommittee for focusing on both the feasibility and impacts of reducing the use of pesticides in the production of our food. The release last month of the National Research Council report, "Pesticides in the Diets of Infants and Children", and announcement of the federal government's commitment to reduce pesticide use have given the subject of pesticides new prominence. Clearly, the central issue today is not whether it is necessary to reduce pesticides, but how it can be done effectively, fairly, and with minimal adverse effects.

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Slowly but surely, the nation's land-grant agricultural colleges, the U. S. Department of Agriculture, and many other organizations have come to appreciate that our chemical-intensive, capital-intensive industrialized agriculture, though producing abundant food supplies, has also had unforeseen ill-effects. As a result, we are seeing more research and education on alternative farming systems and learning more each day about the feasibility of reducing pesticide use.

A small, but highly visible program launched by the USDA in 1988, called the Sustainable Agriculture Research and Education (or SARE) program, has teamed up farmers, scientists, and educators around the country in an exciting process of identifying, developing, and testing sustainable farming approaches that typically reduce farmers' dependence on off-farm inputs such as synthetic chemical pesticides and fertilizers. The approaches examined include the substitution of information and skilled management for purchased inputs, increased use of crop rotations and soil conserving practices, crop-livestock diversification, mechanical cultivation, integrated pest management techniques, and greater reliance on naturally occurring processes.

As Director of the SARE program in 1988-90, I have seen firsthand the doors this little program has opened and the new thinking it has spawned in the traditional research community, despite lack of support for it in the previous Administration. The Wallace Institute, convinced of the promise of SARE, has joined repeatedly with other like-minded groups to urge that the annual appropriation for it be increased to the $40 million authorized by the Congress in the 1990 Farm Bill. The current funding, $6.725 million, is less than one half of one percent of the more than $1.5 billion appropriated this year for USDA-funded food and agricultural research and extension education.

The results of the SARE program so far, with growing support from traditional agricultural research, tell us that for a great many farmers there are potential and often proven alternatives to extensive use of pesticides; that neither food output nor farmer profits need to suffer if they are adopted; and that the benefits of these alternatives can be expected to increase over time (and their costs to decline) as farmers gain experience using them and the government and the agricultural industry provide information and tools to support their use.

As for impacts on consumers, I am confident that the health, safety, and food quality benefits of reducing pesticide use can be achieved without increasing the price of food--if we put our minds to it. But admittedly the scientific evidence is limited. A 1990 report by economist Ronald D. Knutson and his colleagues at Texas A & M University, titled **Economic Impacts of Reduced Chemical Use**, concluded that eliminating (not just reducing) the use of synthetic chemical pesticides and fertilizer, by lowering yields and total

production of major crops, would double the incomes of crop farmers, depress those of livestock producers, and increase annual food prices by more than $400 per household.

The Knutson study has since been widely criticized by other scientists. They have questioned the analytically convenient but unrealistic assumption that no chemicals would be used by farmers. They have criticized the research procedures used, such as asking agricultural scientists around the country who were reared on chemical-intensive conventional agriculture to estimate probable crop yields without any chemical inputs. As relatively low yields were predicted by those scientists, higher food prices were predicted.

In 1991, the Wallace Institute, troubled by the lack of high quality relevant research on possible impacts of adopting sustainable farming systems, convened a small group of leading social scientists to examine and recommend ways to strengthen research on likely impacts of sustainable farming. The group agreed that while new indicators, data, and research techniques are needed to effectively analyze sustainable agriculture, substantial progress in this area of research requires "a fundamental change in the philosophy and mindset of those who administer and conduct the Nation's agricultural research" (see Institute for Alternative Agriculture, Occasional Paper Series Number 2, **An Agenda for Research on the Impacts of Sustainable Agriculture**, July 1991).

While research is yet to shed meaningful light on food price impacts, the age-old principle of demand and supply can surely give us useful insights. In its simplest form, it says that if production declines, food prices are expected to rise; and if production goes up, food prices will go down. But actual price effects can and should be softened by diversification.

On farms, diversification of enterprises and practices can do much to reduce not only weather and market risks, but also the farmer's dependence on pesticides. It is widely regarded as an important potential ingredient of sustainability in areas where monocultural farming is the rule. Similarly, diversification in input supply, processing, and marketing firms can dampen adverse price impacts due to changes in farming practices and in the markets for individual farm commodities. And diversification in diets and food purchases, whenever possible, is not only healthful but good for the consumer's pocketbook when unavoidable food price changes occur.

The impact of reducing pesticide use will also depend on how important the raw farm product is in the final food product the consumer buys in the store (or in a restaurant). According to the U. S. Department of Agriculture, the value of grain in a loaf of bread in 1992 was only 5 percent of the price of that bread in the food store. The farm value of choice beef, in contrast, was 57

percent of the retail price. The value percentages for various other food items are shown below:

Food	Farm value as percent of retail price
Bread	5
Corn Flakes	7
Canned tomatoes	10
Frozen peas	14
Canned green beans	14
Canned pork and beans	15
Fresh Calif. oranges	18
Lettuce	18
Rice	19
Margarine	19
Apple juice	23
Raisins	28
Apples, red delicious	28
Dried beans	34
Pork	34
Frozen orange juice	40
Milk	43
Chicken, broiler	51
Eggs	54
Beef, choice	57

Source: USDA, Agriculture Information Bulletin 669, **Food Costs...From Farm to Retail in 1992,** April 1993.

What these percentages mean is that even if reducing pesticide use on farms were to increase per unit farm production costs, which are then passed on to consumers, the effect on the final price of many foods would be far less significant than the farm level change alone would indicate. Of course, this moderating effect could be partially offset by pricing decisions of nonfarm firms involved in the production, processing, and movement of food from the farm to the dinner table.

Dr. Stewart Smith, formerly a senior economist with the Joint Economic Committee of the Congress, explains that input and marketing sectors of the food system are now in charge of and are paid for many of the functions and services once performed by farmers. Smith estimates that between 1910 and 1990, as value adding activities once performed by farmers were shifted to nonfarm firms, the farm sector's share of the total economic value added to farm products declined from 41 to 9 percent. In the same period, the input sector's share rose from 15 to 24 percent, while the

marketing sector's share increased from 44 to 67 percent (see Smith, Stewart, "Farming Activities and Family Farms: Getting the Concepts Right" presented at a Joint Economic Committee Symposium on Agricultural Industrialization and Family Farms: The Role of Federal Policy, in Washington, D. C., on October 21, 1992).

Though widely regarded as signs of progress and efficiency, these shifts in the contributions and rewards of the different sectors could have substantial effects on food price swings, if only because nonfarm firms tend to be able to influence their prices more than farmers can theirs. The net price effects would be difficult to predict, but the message is clear: If we want to understand and effectively monitor the impacts of reduced pesticide use on food prices, we must look not only at the demand and supply for different kinds of food, and what happens on farms, but also, and especially, at the behavior of the rest of the food system.

In the long run, I personally believe we should recognize that adverse effects of pesticides and other unforeseen problems associated with industrialized agriculture might not have occurred at all if we had seen fit to include the hidden costs of food production in the price of food. We still don't count in food prices the cost of declining soil productivity or of removing silt in waterways due to soil erosion. We don't count the health costs borne by people or the damage to fish and wildlife habitat caused by improper use of chemicals. We cover those costs in other ways, through taxes and borrowing, which add to our nation's fiscal deficit. You might say that our "cheap food policy" is not the bargain we once thought it was.

Were we to include such costs in the calculation of economic returns to farmers and other participants in the food system, and therefore in the price of food, we would have to face squarely the hardship that doing so would impose on those in our society for whom even cheap food is too costly. But the argument for safe, wholesome food for everyone, rich and poor, produced in ways that conserve resources and protect the environment for future generations is just as compelling as the goal of keeping food prices down. Instead of hiding the costs of a cheap food policy, as we now do, perhaps it would make more sense to count those costs in the marketplace and to use the taxes saved to directly aid those for whom higher food prices would be an intolerable burden.

For now, based on what we know today, I do not expect wise reduction in the use of pesticides to increase food prices. Banning pesticides completely probably would, but that is not the option considered here. As pesticide reductions would promise innumerable benefits, including the possibility of lower food prices in the future, the advantages of moving in that direction are inescapable.

THANK YOU.

Mr. TOWNS. Let me begin by asking, Mr. Wiles, in your view, must the public health issue from pesticide residue be secondary to assuring Americans that we have an adequate food supply?

Mr. WILES. Should public health be secondary, no. Public health should be primary. I support the conclusion of the National Academy of Sciences committee that in the past agricultural benefits have weighed too heavily in EPA's decisionmaking on pesticides, and that should be reversed. Public health should lead, and I think it is clear that if public health is the overriding concern, we will still have an abundant and affordable food supply.

Mr. TOWNS. Who should bear the cost of the alternative methods, and how can we avoid passing them on to the consumer? I think I want to ask all of you that.

We will start with Dr. Schaller.

Mr. SCHALLER. I come back to research and education. I think the starting point is to try to figure out how we can farm in ways that will not increase these costs. We need to be aware of what came out of the earlier panel discussion about the entire food system and how the distribution system is geared to commercial agriculture, not to be a sustainable system.

I think it is important to monitor the rest of that food system.

Many firms in the food system are able to influence prices in ways that farmers cannot, and there will be risk in this kind of a system.

Mr. TOWNS. Dr. Goldburg.

Dr. GOLDBURG. I agree with much of what Dr. Schaller said, that part of the goal has to be new research and extension and applied farming systems. I think that not only do we need some new innovations, but we need to understand how to combine existing techniques in ways that would better serve farmers.

Beyond research and extension, something that Dr. Rosenfeld touched on earlier is that we need to change the way many of our agricultural subsidy systems work so that they provide incentives for farmers not to use pesticides, rather than the reverse, which is in many cases what they do now.

Mr. WILES. I think systems today show that in many cases, there need not be a price increase to consumers to deliver a low-residue or an organic product to market. I think Mr. Pratt made it clear that with the right kinds of marketing and an expanded market, organic food can be competitive. A scientific certification program shows that a non-detected residue line of fruits and vegetables can be delivered at a competitive price today in abundance. Organic is unable to meet this challenge for every crop in every situation, but I think the issue of price increases to consumers is entirely overstated and overplayed.

There need not be price increases to deliver a lower-residue fruit and vegetable today to consumers.

Mr. TOWNS. Thank you.

I yield to the ranking member of the subcommittee, Mr. Schiff.

Mr. SCHIFF. Thank you, Mr. Chairman.

Again, I appreciate the testimony. As with the last panel, I feel like follow-up from me may have to continue until we hear all of the witnesses on the subject from the Government panel.

Dr. Goldburg, I am familiar, I believe, with the Environmental Defense Fund; but Mr. Wiles, I don't know what the Environmental Working Group you are affiliated with—that nomenclature to me means ad hoc groups that work on specific subjects. Is that true in your case?

Mr. WILES. I hope it is not an ad hoc group. We were formerly the Center for Resource Economics, and we changed our name about a month ago with the release of Pesticides in Children's Food report. We are the same group, same people with a new name.

Mr. SCHIFF. I didn't know about the name change.

Dr. Schaller, what is the Henry A. Wallace Institute for Alternative Agriculture?

Mr. SCHALLER. We were established as the Institute for Alternative Agriculture, 10 years ago, started by a person who worked for the Department of Agriculture at the time that Reagan was elected. He was Garth Youngberg, the organic farming coordinator. The Reagan administration had reservations about that, and Garth left the Department and established this institute primarily to be an information source and a catalyst for thinking about farming in ways that are more sustainable. Earlier this year, the institute's name was changed to the Henry A. Wallace Institute for Alternative Agriculture.

Organic farming was not regarded very highly around 1981. Earl Butz, a former Secretary of Agriculture, said of it, who will decide which 50 million of our people will starve? We have come a long way since then.

Mr. SCHIFF. Is Henry Wallace not a former Vice President of the United States?

Mr. SCHALLER. He was. He Secretary of Agriculture in the 1930's, and then became Vice President. He was also a Secretary of Commerce and might have been a President had it not been for Roosevelt's choice of Harry Truman as his last running mate.

Mr. SCHIFF. I want to know who all the players are as we proceed.

I yield back, Mr. Chairman.

Mr. TOWNS. Thank you very much, Congressman Schiff.

Let me first thank you for coming. I would like the record to reflect from the testimony presented today we have seen impressive examples of how growers, industry, researchers, and the Federal Government can work together in producing a safer food supply for America.

The witnesses who testified before us have told us that, yes, it is feasible for the American grower to reduce his reliance on chemical agriculture. Momentum is in place to begin a new era of food safety and health for our society. We look forward to the administration's announcement of the specifics of its policy for reducing pesticide residue in our foods. In September, we will invite USDA and the FDA before us to hear of the administration's new programs.

As Chair of this subcommittee, I intend to continue to monitor the safety of our food supply and keep this issue in front of the American people.

I would like to thank all the witnesses for their testimony and for everyone who attended this hearing. I would like to thank the

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ranking member, Mr. Schiff, for all the support he has given. This subcommittee hearing is adjourned with the understanding that there will be some follow-up.

The committee adjourns.

[Whereupon, at 12:50 p.m., the subcommittee was adjourned.]

[The prepared statement of Hon. Donald Payne follows:]

Opening Statement
Subcommittee on Human Resources and Intergovernmental Relations
Hearing--"Safer Foods for America:
At What Cost?"
Rep. Donald Payne (NJ-10th)
July 27, 1993

Good Morning. I would like to first commend the chairman for calling this hearing on this very important subject. I would also like to extend my regards to the panel of witnesses who have agreed to testify before us today.

Food safety is an issue that affects us all. Right now, the longterm chronic exposure to pesticides is unknown. And, following the report issued by the National Academy of Sciences and the Environmental Working Group about the widespread consumption of pesticide residues by Americans, most especially infants and children, there is growing public concern about the safety of our food.

The National Academy of Sciences and the Environmental Working Group reported that millions of American children ingest up to 35% of lifetime doses of some carcinogenic pesticides and Charles Benbrook a former NAS Study Director, stated that children are exposed to a majority of the cancer risk by the time they are ten.

Equally alarming are new studies that assert that pesticide residues adversely stimulate estrogen production, directly linked with breast and testicular cancers.

The problems associated with pesticide use have prompted the emergence of alternative farming methods -- namely, biotechnology, integrated pest management, no detected residue certification and organic farming. The U.S. Department of Agriculture devotes less than 7 percent of their budget to promoting alternative methods, and therefore research and development is left largely to the industry.

I would like to again commend the chairman on his foresight on this issue and the potential problems that accompany it by calling this hearing and I look forward to the testimony of our witnesses.

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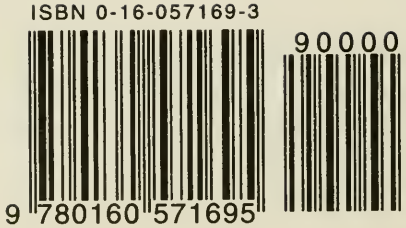
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